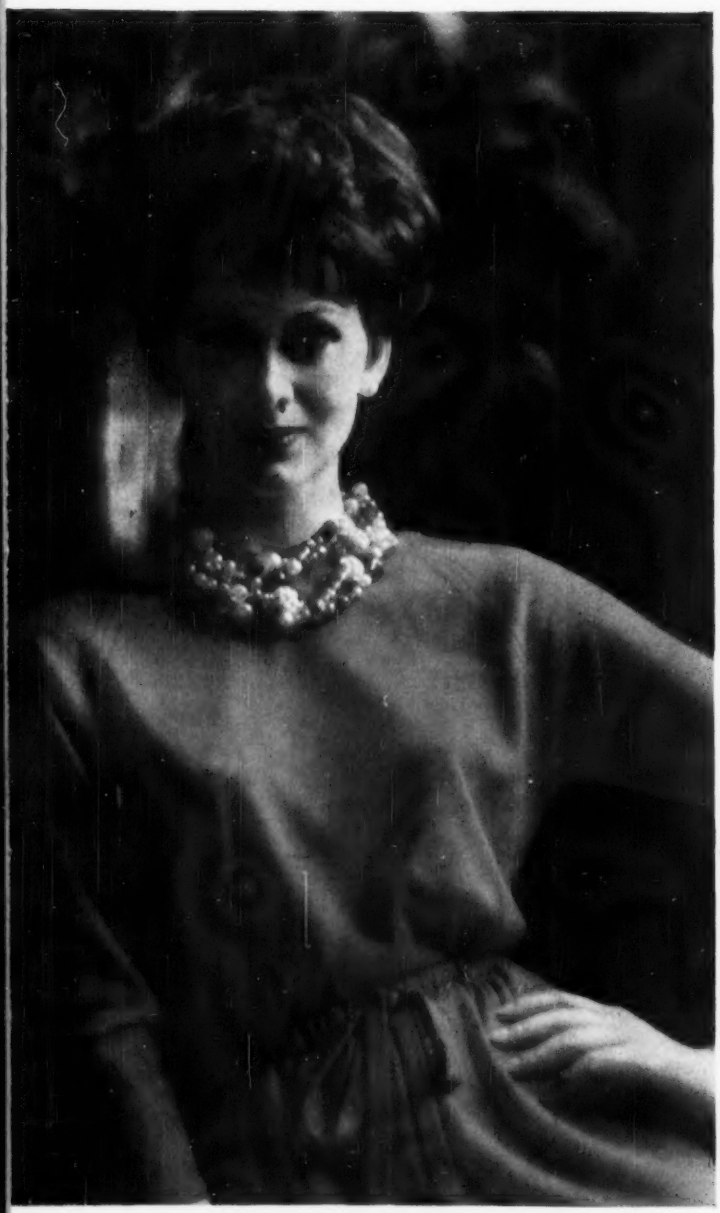
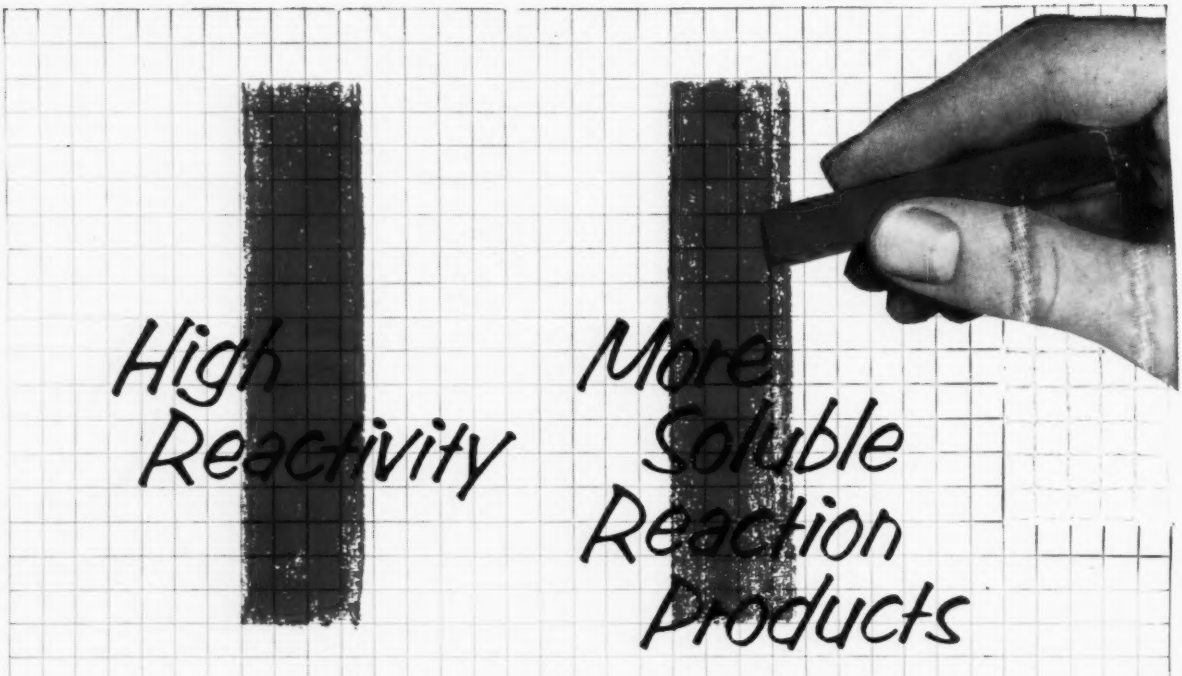
Chemical Week



JUNE 11, 1960 Price 50 cents

A McGRAW-HILL PUBLI



You get BOTH in all 6 forms of

SOLVAY CAUSTIC POTASH

When you start with a more reactive material like Solvay® Caustic Potash, you usually get better results. Many users prefer it to caustic soda because it enables them to produce more soluble reaction products and less viscous solutions.

For example, its high solubility permits liquid end products having high soap concentration. Many heavy-duty liquid detergents would not exist were it not for ingredients derived from caustic potash.

Its high reactivity is also useful in mercaptan extraction and desulfurization of petroleum products. Caustic potash solutions effectively absorb carbon dioxide and hydrogen sulfide in industrial gases. Dry forms are highly hygroscopic, excellent for dehydration.

Sodium Nitrite • Calcium Chloride • Chlorine • Caustic Soda • Caustic Potash Potassium Carbonate • Sodium Bicarbonate • Chloroform • Methyl Chloride Soda Ash • Vinyl Chloride • Ammonium Chloride • Methylene Chloride • Carbon Tetrachloride • Snowflake® Crystals • Monochlorobenzene • Ortho-dichlorobenzene Para-dichlorobenzene • Ammonium Bicarbonate • Hydrogen Peroxide • Aluminum Chloride • Cleaning Compounds • Mutual® Chromium Chemicals

Allied Chemical

SOLVAY PROCESS DIVISION
61 Broadway, New York 6, N. Y.

SOLVAY branch offices and dealers are located in major centers from coast to coast.

Mail the coupon for samples and *new* Solvay Technical Bulletin crammed with facts, tables, diagrams for applying caustic potash.

18-60

SOLVAY PROCESS DIVISION
ALLIED CHEMICAL CORPORATION
61 Broadway, New York 6, N. Y.

Please send me without cost:

Samples of Technical Grade Caustic Potash
☐ Flake ☐ Small Flake ☐ Solid
☐ Granular ☐ Liquid, 45% strength
☐ Liquid, 49-50% strength

Samples of Mercury Cell Caustic Potash
☐ Flake ☐ Liquid, 45% strength

☐ New Technical Bulletin 15, Caustic Potash

Name _____

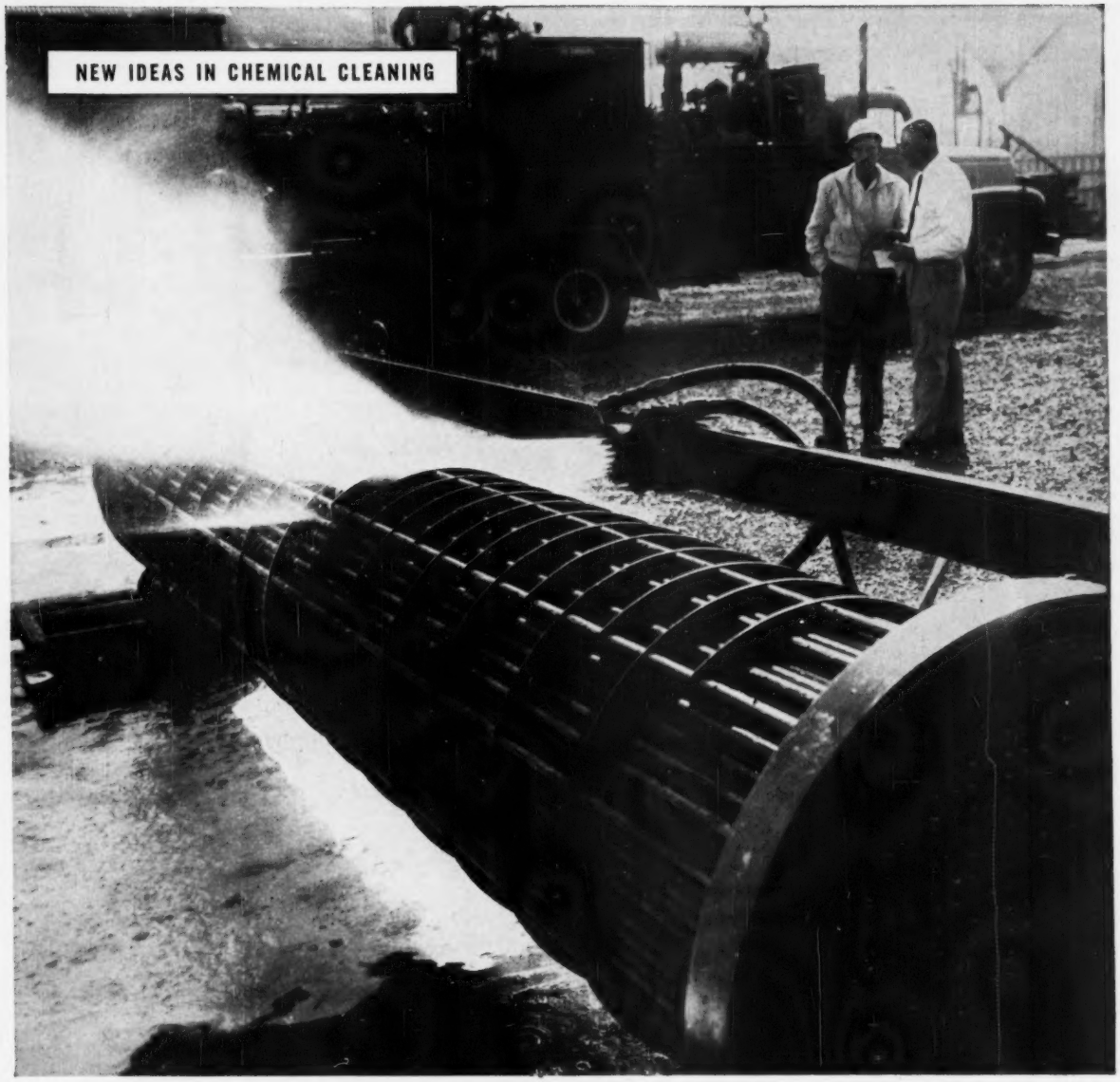
Position _____

Company _____

Phone _____

Address _____

City _____ Zone ____ State _____



New Jetting Tool To Clean Tube Bundles Saves Thousands Of Dollars

The new high-pressure hydraulic tool, shown above, is currently saving thousands of dollars for companies in the refining, chemical, and petrochemical industries. It is the jetting tool developed by Dowell to remove deposits from heat exchanger tube bundles.

Previous methods of cleaning these bundles have been costly, time-consuming and often inadequate. Many times bundles had to be replaced completely because of the lack of a suitable cleaning method.

This new tool has a remarkable record of thorough, fast cleaning. For example, a slurry reboiler exchanger bundle, three feet in diameter and 16 feet long, was fouled with deposits of coke and asphalt. After being jetted from only one side, the bundle was thoroughly clean. Time required: less than one hour.

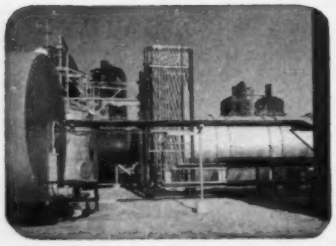
The tool holds the bundle in place for cleaning and has flanged rollers for rotation. The jet-head is manipulated automatically so that all tube spaces are covered. The jetted liquid can be either water or chemical solvents.

The new Dow Industrial Service Division will continue to offer the service which was formerly provided through the Dowell Division. For engineered recommendations to solve your cleaning problems contact the field office nearest you, or write Dow Industrial Service, 20575 Center Ridge Road, Cleveland 16, Ohio.

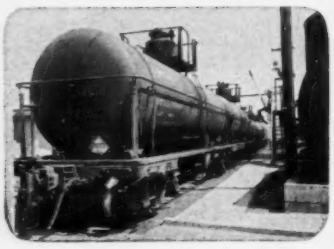
DOW INDUSTRIAL SERVICE

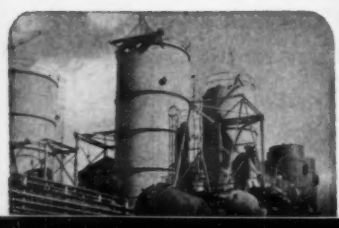
DIVISION OF THE DOW CHEMICAL COMPANY

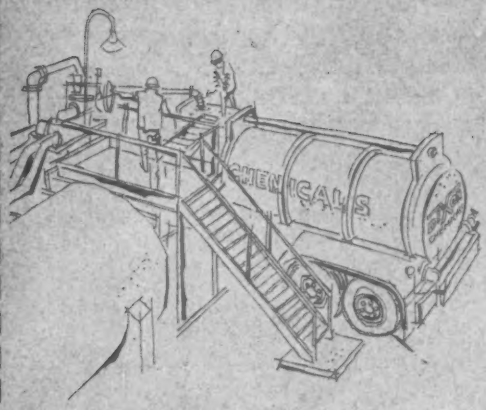
DOW



DIXON
CHEMICALS







TEAMWORK . . .
THE MOST IMPORTANT
INGREDIENT
IN THE DIXON
DRIVE TOWARD
BETTER CHEMICALS
FOR BETTER INDUSTRY.

THE IMAGE OF ACTION

DIXON . . .
THE East Coast's
supplier of:
SULFURIC ACID
ALUMINUM SULFATE
CORNSTARCH
HYDROCHLORIC ACID

DIXON CHEMICAL AND RESEARCH, INC.
Executive Offices:
1260 Broad Street
Bloomfield, N. J.
EDison 8-4000

Sales Offices:
Bloomfield, New Jersey
Paulsboro, New Jersey
Providence, Rhode Island

ON THE COVER: In the terms of the fashion world, the dress on the cover is a "draw-string sheath, a well-seasoned traveler that washes with undimmed radiance." It's knitted of American Cyanamid's Creslan acrylic fiber.

Chemical Week

Vol. 86, No. 24 JUNE 11, 1960

Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Co., James H. McGraw (1860-1948), founder. EXECUTIVE, EDITORIAL, CIRCULATION AND ADVERTISING OFFICES: McGraw-Hill Building, 330 West 42nd St., New York 36, N. Y. Place of publication: 3rd and Hunting Park Ave., Philadelphia 40, Pa. Second class postage paid at Philadelphia. (See below for directions regarding subscriptions or change of address.) OFFICERS OF THE PUBLICATIONS DIVISION: Nelson L. Bond, president; Shelton Fisher, Wallace F. Traendly, senior vice-presidents; John R. Callaham, vice-president and editorial director; Joseph H. Allen, vice-president and director of advertising sales; A. R. Venezian, vice-president and circulation coordinator. OFFICERS OF THE CORPORATION: Donald C. McGraw, president; Joseph A. Gerardi, Hugh J. Kelly, Harry L. Waddell, executive vice-presidents; L. Keith Goodrich, vice-president and treasurer; John J. Cooke, secretary.

United States and United States possessions subscription rate for individuals in the field of the publication, $3 per year; single copies, 50¢. Foreign subscription rates per year: Canada, $4; other Western Hemisphere countries, $15; all others, $25, payable in advance. Printed in U.S.A. Title registered in U.S. Patent Office,

Subscriptions to Chemical Week are solicited from management men in the Chemical Process Industries in administration, production and plant operation, design and construction, research and development, sales and purchasing. Position, company connection and nature of company's business, products and approximate number of employees must be indicated on subscription application. Send to address shown below.

SEND SUBSCRIPTION CORRESPONDENCE AND CHANGE OF ADDRESS TO FULFILLMENT MANAGER, CHEMICAL WEEK, 330 WEST 42nd ST., NEW YORK 36, N. Y. SUBSCRIBERS SHOULD NOTIFY FULFILLMENT MANAGER PROMPTLY OF ANY CHANGE OF ADDRESS, GIVING OLD AS WELL AS NEW ADDRESS, AND INCLUDING POSTAL ZONE NUMBER, IF ANY. IF POSSIBLE, ENCLOSE AN ADDRESS LABEL FROM RECENT ISSUE OF CHEMICAL WEEK. PLEASE ALLOW ONE MONTH FOR CHANGE TO BECOME EFFECTIVE.

Postmaster: Please send Form 3579 to Chemical Week, 330 West 42nd St., New York 36, N.Y.

ROTARY OR CENTRIFUGAL

...Which one is best for your application?

Rotary or centrifugal? Sometimes the choice is easy. For example, you would use a rotary pump for very viscous liquids (over 2500 s.s.u.). Or where poor suction conditions exist. Or when positive displacement is required. Centrifugal pumps would be used for extremely corrosive or abrasive liquids, low viscosity liquids (under 2500 s.s.u.) water, slurries, or petroleum products.

But . . . in many applications combinations of these factors exist. Or the liquid you want to pump is not clearly in either area. Then there are other considerations such as initial cost, operating cost, lubrication value of the liquid, location and even budget limitations.

All of these considerations can put you in the middle—where either a rotary or centrifugal can be used. The best choice can only be made by someone with experience and knowledge of both types.

As one of the few manufacturers of a complete line of both rotary and centrifugal pumps, Worthington can help you select the best, most economical solution to this perennial pump problem. For the name and address of your nearest Worthington representative, consult the yellow pages.

P.S. If you'd like a copy of a 50-page booklet, "Rotary and Centrifugal Pumps: Theory and Design," please write to Worthington Corporation, Section 20-14, Harrison, New Jersey, for bulletin G-2666.

WORTHINGTON

Chemical Week

Robert S. Muller ..... Publisher
Howard C. E. Johnson ..... Editor-in-Chief

Ralph R. Schulz ..... Managing Editor
Emil J. Mikity ..... Assistant Managing Editor
J. Robert Warren ..... Assistant Managing Editor
Donald P. Burke ..... Associate Editor
Anthony J. Piombino ..... Associate Editor

DEPARTMENTS

Administration .... Cooper R. McCarthy, editor
F. Bryan Williams
Business News ..... Homer Starr, editor
Jane B. Munger
Engineering ..... Kenneth C. Wilsey, editor
Ryle Miller
Foreign ..... Bruce Bendow, editor
Markets ..... Philip A. Cavalier, editor
Production ..... Herbert C. Short, editor
Research ..... Joseph F. Kalina, editor
Philip A. Untersee
Sales ..... Carl A. Hiester, editor
Walter E. Andrews
Specialties ..... Richard J. Callahan, editor
Marion L. Meade
Reports ..... Jorma Hyypia, editor
Vincent L. Marsilia

Copy ..... William Mullinack, editor
Henry S. Gordon
Art ..... Robert T. Martinott, director
Richard Kluga, Forbes Linkhorn
Dolores Able
Buyers' Guide ..... Betsy L. Emery

REGIONAL EDITORS

Chicago ..... John M. Winton, editor
Nina Seawick
Houston ..... Thomas H. Arnold, editor
Wilma Cortines
San Francisco ..... Martin D. Robbins, editor
Terry Shaw

NATIONAL AND WORLD NEWS

Dexter M. Keezer ..... Economics
John Wilhelm ..... Director, News Bureaus

Domestic

Atlanta, B. F. Barnes; **Chicago**, Stewart Ramsey; **Cleveland**, Arthur Zimmerman; **Dallas**, Marvin Reid; **Detroit**, Donald MacDonald; **Los Angeles**, Kemp Anderson, Jr.; **San Francisco**, Jenness Keene; **Seattle**, Ray Bloomberg; **Washington**, George B. Bryant, Jr. Correspondents in 75 principal cities of the United States.

Foreign

Beirut, O. M. Marashian; **Bonn**, Morrie Helitzer; **Caracas**, John Pearson; **London**, John Shinn; **Melbourne**, Alicja Grobtuch; **Mexico City**, Peter Weaver; **Moscow**, Ernest Conine; **Paris**, Robert E. Farrell; **Rio de Janeiro**, Leslie Warren; **Tokyo**, Sol Sanders. Correspondents in 78 cities.

Knox Armstrong .... Advertising Sales Manager
Alvin J. Babkow ..... Business Manager
Fred E. Lesner ..... Sales Promotion Manager
Margaret J. Swikart .. Market Research Manager
Robert L. Maier ..... Advertising Makeup
Paul W. Erb ..... Circulation Manager
Frances Regan ..... Reprints
Advertising Salesmen ..... See Adv. Index

VIEWPOINT

Conflict-of-Interest Dilemma

AS DISCLOSURE of a Food & Drug Administration official's outside income (*CW Washington Newsletter, May 28*) was sparking public furor, an article in *Science* (May 20, p. 1508) explored the seemingly impossible task of avoiding conflicts of interest by key government scientists. Pointing out that the government underwrites more than half the scientific research done in this country and has ties with most leading scientists, *Science*, published by the American Assn. for the Advancement of Science, reported "a question of conflicts could be raised in almost every case" of such employment.

What's needed, the journal suggests, is "clear understanding among the public and on Capitol Hill that the risk of an occasional scientist acting indiscreetly is trivial compared with the risks to the national security if, in order to strictly enforce the conflict-of-interest laws, the government were forced to cut itself off from the soundest scientific assistance it can get."

These laws are described as "a group of seven poorly defined, vaguely interpreted statutes that, in their broadest interpretation, prohibit anyone working for the government from having a financial interest in any group having dealings with the government." The situation is particularly touchy in the case of scientific personnel because of government reliance on "an intricate web of consultancies, contracts, and part-time and temporary employees to provide itself with the scientific and technical assistance it must have."

Calling the situation "awkward," but also "absolutely unavoidable," *Science* explains: "The government clearly needs the best scientific advice it can get, and it can get this advice only from men with the pertinent experience—that is, in most cases, precisely from the men who will find themselves in a conflict-of-interest situation."

That's not to say nothing is being done about the problem. This month the Harvard University Press is publishing a report, prepared by a committee of the Bar Assn. of New York, which contains draft legislation designed to update current conflict-of-interest laws.

But the feeling persists that legislation isn't the entire answer to the dilemma, the other horn of which is *laissez faire* with its attendant risks. "The problem is one that cannot be legislated out of existence," says *Science*. "Some sort of rules governing conflicts of interest are necessary, and no matter how carefully they are framed there will still be a great many difficult situations, particularly in the case of scientists. The bar group's draft legislation hopes to help matters by giving the President broad powers to grant exemptions 'in the national interest.' But an exemption can only make a conflict of interest allowable; it does not make it disappear."

Chemical process companies, working closely with the government in many fields—nuclear energy, missile fuels, anticancer chemical screening—have more than a casual interest in any proposed new conflict-of-interest legislation.

If nothing else, they've a stake in preserving the relatively recent public admiration for researchers, a respect born of many achievements that translate into public benefits. "The question of scientific prestige is a special one," says *Science*. "If a lawyer or business executive is caught with his hand in someone else's pocket, no one is led to question the ethics of lawyers or executives as a class. Whether the same will hold for scientists is open to question."

LETTERS

Plant, Not Company

TO THE EDITOR: One million dollars would indeed be a bargain price for The Richardson Co. (*April 30, p. 25*), since our earnings last year exceeded that figure by a wide margin. The item, of course, was in reference to the sale of our Newnan, Ga., plant rather than a sale of our company.

Studies for the design, location and construction of a new plant to better serve our customers in the Southeastern area are already under way. In the meantime, warehouse facilities have been leased in Newnan to maintain our usual service in this area.

J. R. DUDLEY
Vice-President
The Richardson Co.
Melrose Park, Ill.

Documentation Data

TO THE EDITOR: You published an article (*Feb. 20, p. 75*) titled "Closing the Loop on Literature Automation," which attempted to assess both research and development activities and operating information systems, in the field of scientific and technical (particularly chemical) documentation.

You mentioned (*at the bottom of the chart on p. 80*) that your information source was the National Science Foundation. It appears that the source was National Science Foundation's report, "Nonconventional Technical Information Systems in Current Use," No. 2, Oct. 1959.

I realize you were not trying for complete or detailed discussion of the subject in your article. Your readers might be interested to know, however, that the coverage of that booklet . . . was by no means complete; it was our intent to describe examples of various types of systems. We have since issued a supplement to that Report No. 2; the supplement is dated April '60 and describes 21 additional systems, including a sizable one operated since '53 by the Science Information Dept. at Smith Kline & French Laboratories, a pioneer in developing dynamic information services and automatic searching systems.

Your readers might also be interested in the additional information on the development of mechanized systems that appears in our report series, "Current Research and Development in Scientific Documentation." The latest in this series and also the "systems" booklets are available from the Office of Science Information Service, National Science Foundation, Washington 25, D.C., or through the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.

MADELINE M. HENDERSON
Professional Assistant
Program for Documentation Research
National Science Foundation
Washington

MEETINGS

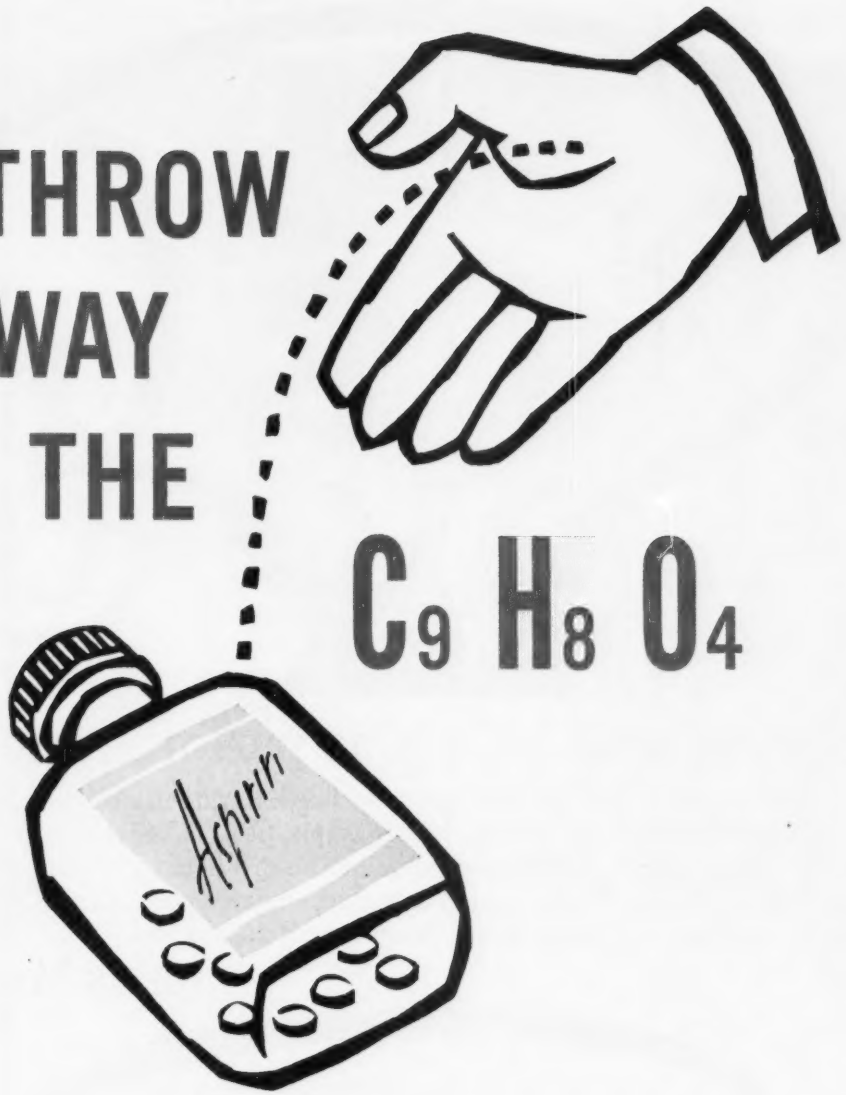
Chemical Institute of Canada, 43rd Canadian chemical conference and exhibition, Ottawa, June 13-15.

Gordon Research Conference at Colby Junior College, New London, N.H.—June 13-17, petroleum: friction, lubrication and wear; June 20-24, elastomers: structure and properties; June 27-July 1, nuclear chemistry: July 4-8, polymers; July 11-15, textiles: July 18-22, corrosion: July 25-29, separation and purification: Aug. 1-5, instrumentation: Aug. 8-12, food and nutrition; Aug. 15-19, medicinal chemistry; Aug. 22-26, catalysis; Aug. 29-Sept. 2, cancer.

Gordon Research Conferences at New Hampton School, New Hampton, N.H. —June 13-17, chemistry of coal; June 20-24, information processing for critical cables of scientific data; June 27-July 1, proteins and nucleic acids; July 4-8, chemistry and physics of isotopes; July 11-15, statistics in chemistry and chemical engineering; July 18-22, radiation chemistry; July 25-29, organic reactions and processes; Aug. 1-5, steroids and other natural products; Aug. 8-12 organic coatings; Aug. 15-19, analytical chemistry; Aug. 22-26, inorganic chemistry; Aug. 29-Sept. 2, adhesion.

Gordon Research Conferences at Kimball Union Academy, Meriden, N.H.— June 13-17, lipide metabolism; June 20-24, cell structure and metabolism secretion; June 27-July 1, physical metallurgy: relation of structure and properties; July 4-8, chemistry at interfaces; July 11-15, chemistry, physiology and structure of bones and teeth; July 18-22, high-pressure research; July 25-29, chemistry and metallurgy of semiconductors; Aug. 1-5, solid-state studies in ceramics; Aug. 8-12, chemistry and physics of solids: point defects: Aug. 15-19, toxicology and safety evaluations; Aug. 22-26, infrared spectroscopy: Aug. 29-Sept. 2, high-temperature chemistry: kinetics of vaporization and condensation processes.

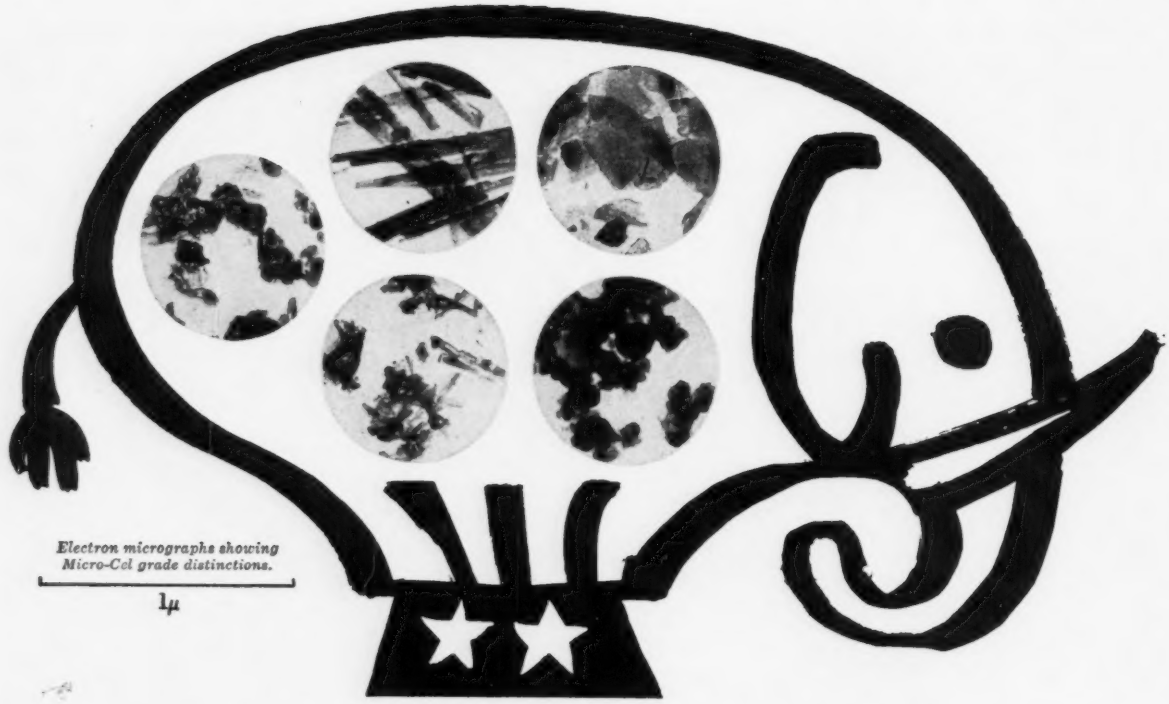
THROW AWAY THE $C_9H_8O_4$



AMSCO is first in sales because AMSCO is first in technical aid. If solvent problems are giving you headaches...throw away the aspirin. Specify AMSCO. You'll get *what you want,* where you want it, when you want it.

AMSCO

AMERICAN MINERAL SPIRITS COMPANY



Electron micrographs showing Micro-Cel grade distinctions.

1μ

Micro-Cel adds bulk plus performance!

4½ lbs. of Micro-Cel®, Johns-Manville's new line of synthetic calcium silicates, bulk to a full cu. ft. Absorbs up to 6 times its weight in water. Costs only 7 to 8¢ a lb. (F.O.B.). Surface areas up to 175 sq. m/gr. If you need a filler to absorb liquids, prevent caking, control viscosity, extend pigments, aid suspension or reduce surface sheen, Micro-Cel is the cost-cutting answer. Mail coupon for information, samples and assistance!

JOHNS-MANVILLE
Celite Division

1960

JOHNS-MANVILLE, Box 14, New York 16, N. Y.
In Canada: Port Credit, Ontario.

☐ Please send additional data.

☐ Please send free sample of suitable grade of Micro-Cel for use in:_____

☐ Have local Sales Engineer contact me.

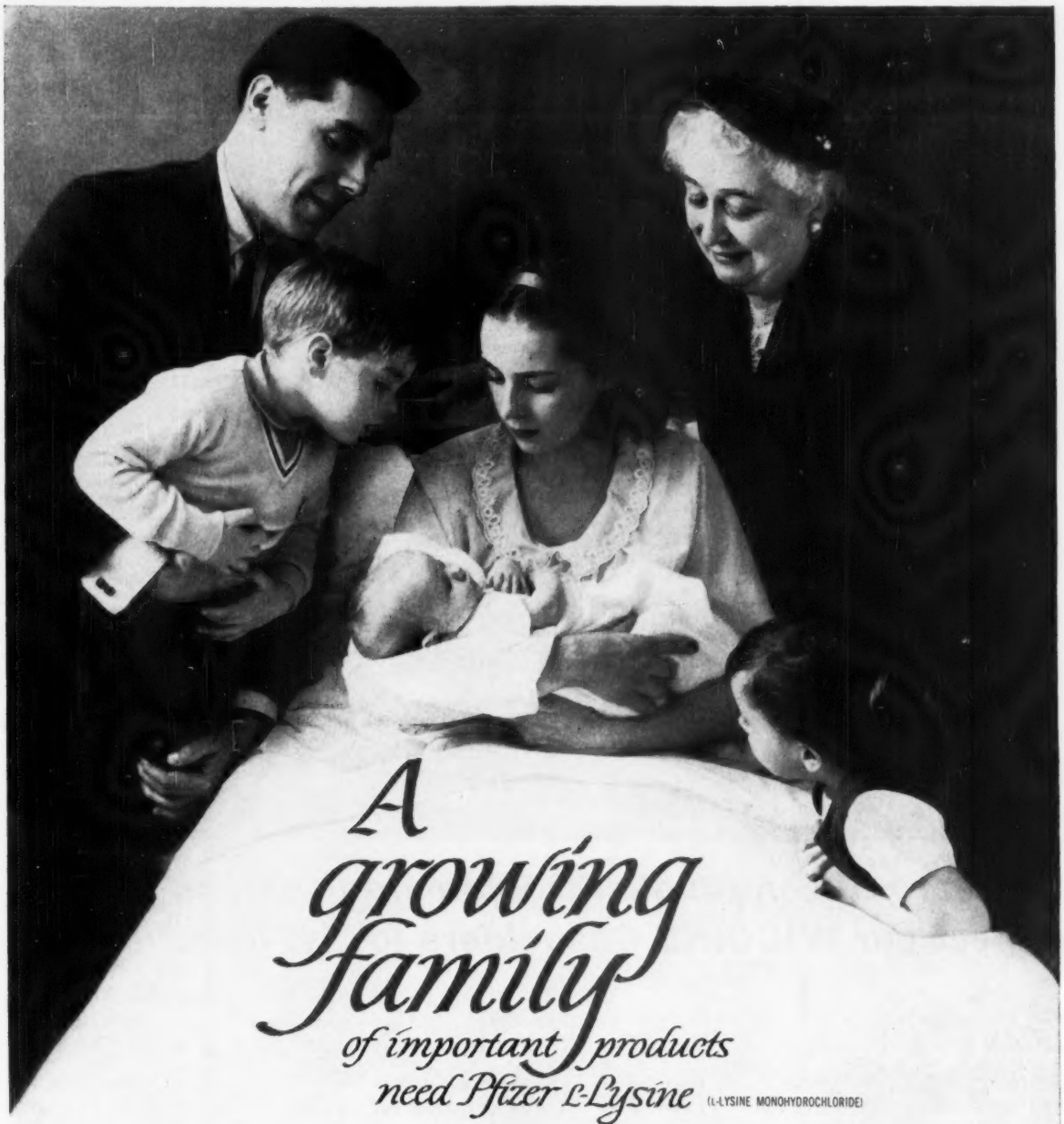
Name_____ Position_____

Company_____

Address_____

City_____ Zone____ County_____ State____

PRENATAL ■ PEDIATRIC PRODUCTS ■ APPETITE STIMULANTS ■ GERIATRIC FORMULATIONS



A growing family of important products need Pfizer L-Lysine (L-LYSINE MONOHYDROCHLORIDE)

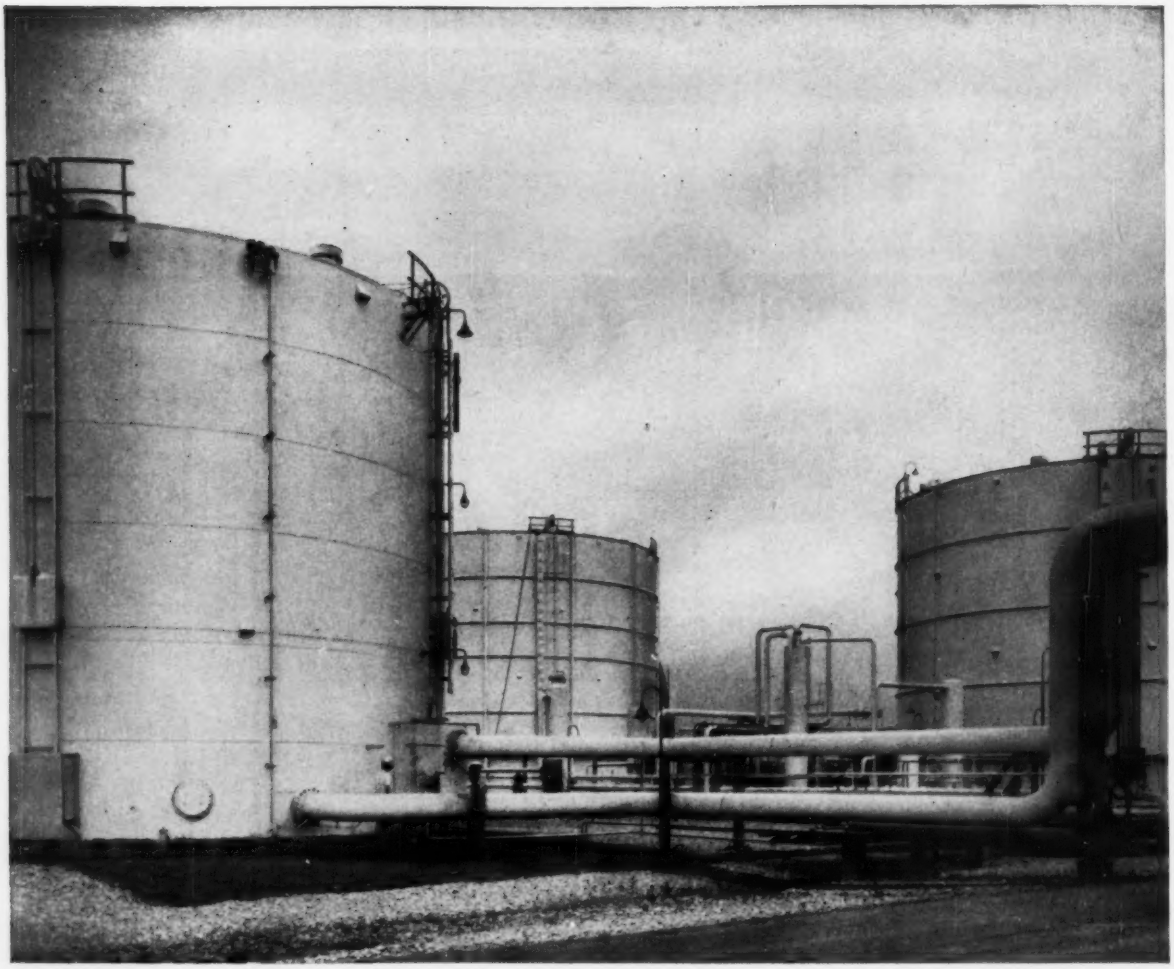
■ **Give your product a valuable boost** in today's bigger-than-ever dietary supplement market by adding Pfizer L-Lysine. ■ Approximately 20-40% of the protein intake in American diets consists of proteins which are deficient in L-Lysine. Infants, youngsters, pregnant women and oldsters, due to their special requirements for high quality protein, represent focal points in possible protein malnutrition. Such people can benefit directly from diet supplements enriched with Pfizer L-Lysine. ■ The presence of Lysine, an essential amino acid, in such products has been credited authoritatively with improving the growth rate of infants with poor appetites ... raising plasma protein and hemoglobin levels ... improving resistance to infection ... raising hemoglobin level of pregnant women where iron therapy had failed ... assisting children in growth failure to assume normal growth pattern ... improving recuperative power of elderly convalescents. Wouldn't these extra health benefits make your product more attractive to customers? ■ You'll find that combinations of Pfizer L-Lysine, vitamins and minerals are readily adaptable to tablets, capsules, powders, syrups and elixirs. ■ Pfizer, a leading manufacturer of this important dietary factor, is anxious to demonstrate how low-cost Lysine can improve your product—and your sales. Write today for full technical data on Pfizer L-Lysine diet supplementation.

SCIENCE FOR THE WORLD'S WELL-BEING

Pfizer

MANUFACTURING CHEMISTS FOR OVER 100 YEARS

Chas. Pfizer & Co., Inc., Chemical Sales Division, 630 Flushing Ave., Brooklyn 6, N.Y. • Branch offices: Clifton, N.J.; Chicago, Ill.; San Francisco, Cal.; Vernon, Cal.; Atlanta, Ga.; Dallas, Tex.; Montreal, Can.



"8 years of continuous, trouble-free service, and we expect our WIGGINS Gasholders to last indefinitely,"

says Vincent C. Henrich, Plant Manager, Rohm & Haas, Deer Park, Texas

Simplicity, safety, continuous usability–these advantages have added up to eight years of continuous operation and dollar savings with General American WIGGINS Gasholders for Rohm & Haas at their Deer Park, Texas plant.

The six gasholders in the Deer Park installation, storing acetylene, range in capacity from 20,000 to 250,000 cubic feet. Since they went into use in 1951 these gasholders have never required shutdown for maintenance or repairs.

"Heart of our storage system," says Mr. Henrich, "is the gas-tight, impermeable WIGGINS Dry Seal. Because it needs no servicing, it eliminates downtime for repairs, and thus increases our production. We inspect our WIGGINS Gasholders only once a year."

The WIGGINS Dry Seal requires no operating accessories, no water, tar, or grease, is resistant to chemical action and weathering, and is unaffected by abnormally low or high temperatures.

For complete data, write or call the nearest General American office. You'll find *it pays to plan with General American.*

Plate and Welding Division

GENERAL AMERICAN TRANSPORTATION CORPORATION

135 South LaSalle Street • Chicago 3, Illinois

Offices in principal cities

from the Delhi Sphere of Petrochemical Activity...

TYPICAL ANALYSIS

Sp. Gr. 15.56/15.56°C	0.871	
API Gravity	31.1	
Weight, Lbs/Gal	7.246	
Color	30+ Saybolt	
Acid Wash Color	Less than No. 1 Standard	
Acidity	No free acid	
Sulfur Compounds	No H_2S or SO_2 or Thiophene	
K. B. No. (Toluene-105)	101	
Distillation		
First Drop	138.0°C	280°F
Dry Point	141.0°C	286°F
Flash TCC	82°F	

DELHI 5° XYLENE

...high solvency thru high purity

Strict adherence to rigid process control standards at Delhi-Taylor pays off in purity products. Delhi-Xylene is a case in point. Its purity is evident in its consistently high KB value, indicative also of its high solvency for paints, inks and other products.

You can depend upon the quality and uniformity of Delhi petrochemicals and are assured of efficient and courteous service.

Delhi 5° Xylene, Benzene, Toluene and other petrochemicals are available by barge, tank car or tank truck from our plants and bulk terminals.

DELHI

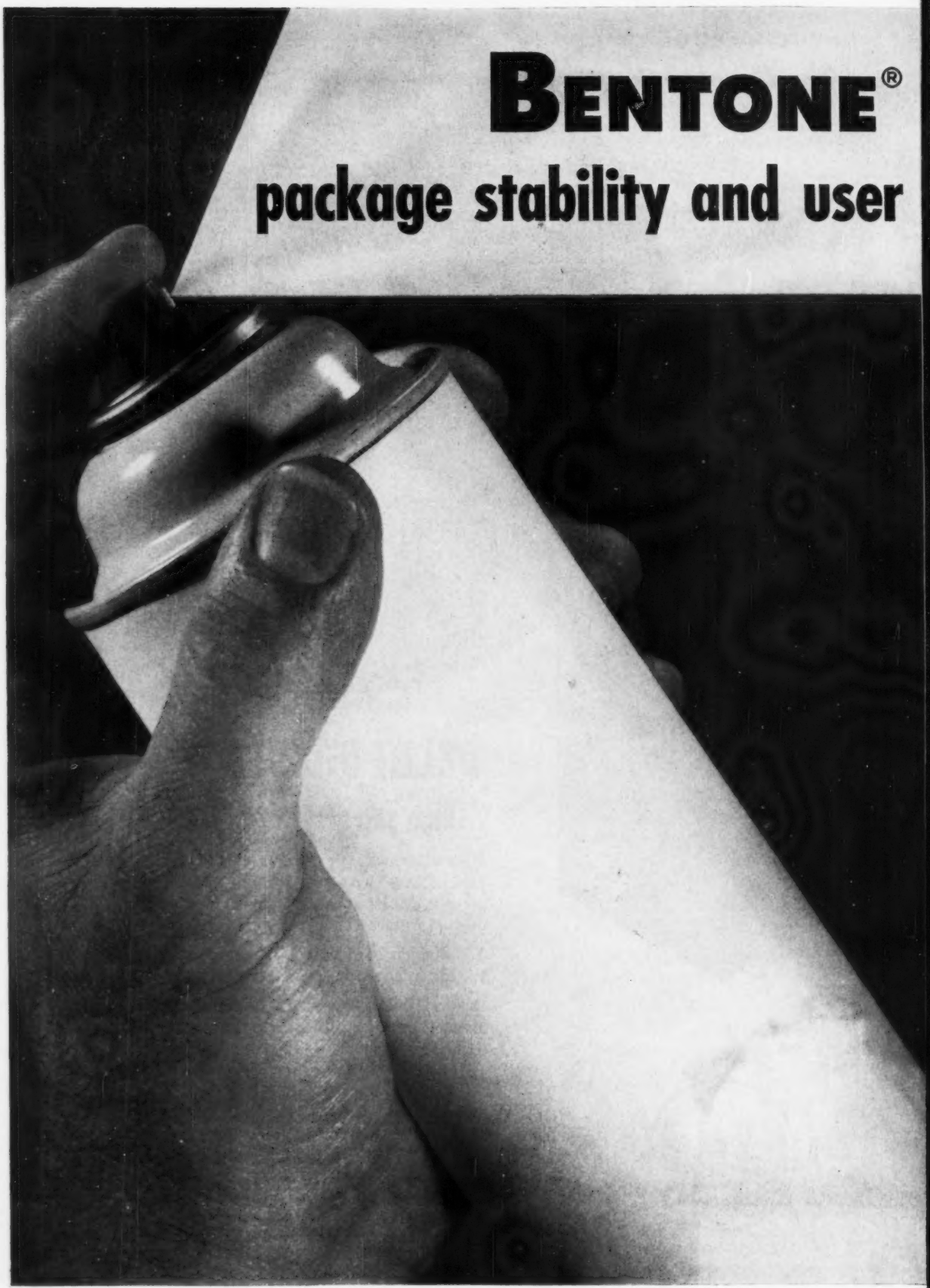
CHEMICAL DIVISION

DELHI-TAYLOR OIL CORPORATION

CORRIGAN TOWER, DALLAS 1, TEXAS

415 MADISON AVE., NEW YORK 17, N. Y.

CORPUS CHRISTI • CHICAGO • CHARLESTON, S. C. • BATON ROUGE • HOUSTON


BENTONE®
package stability and user

thixotropic gelling agents add appeal to your aerosol paints

Now . . . with the four National Lead BENTONE gelling agents . . . you can assure more predictable, more controllable thixotropic spray from your aerosol packs.

All four contribute to package stability, prevent hard pigment settling. And paints made with them go on well, stay on *right*. No cobwebbing or stringing on application. No orange peeling or wrinkling on drying. Color, film thickness, sag and runoff are nicely controlled. Pigment, vehicle and extender are locked into a close-knit structure.

Each BENTONE gelling agent has been developed to do specific jobs well. BENTONE 34 gellant finds wide use in conventional low to medium polarity paints.

BENTONE 38 gellant is specifically recommended for finishes based on odorless solvents.

Then there's BENTONE 27 gellant, useful over a wide range of polarity. It is attracting attention because of its value in high polarity finishes, such as lacquers and vinyl paints.

BENTONE 18-C has found use where the problem is primarily pigment packing, rather than improvement of application properties.

The BENTONE gelling agents are not restricted to paints alone. They will benefit any aerosol application where keeping solids in suspension is a major problem – cleaners, polishes, waxes and buffing compounds, for example.

One of National Lead's versatile thixotropic BENTONE gellants may be just what's needed to put more "buy appeal" in your aerosol-packaged products. Which one to use? That depends in large measure on the application you have in mind. For detailed information or technical assistance in any application, call, write or wire us.

NLC

National Lead Company, *General Offices:* 111 Broadway, New York 6, N. Y. KC-6466A
In Canada: Canadian Titanium Pigments Limited, 1401 McGill College Ave., Montreal
Please send me brochures on:

☐ BENTONE 18-C ☐ BENTONE 27 ☐ BENTONE 34 ☐ BENTONE 38

Name_____ Title_____

Firm_____

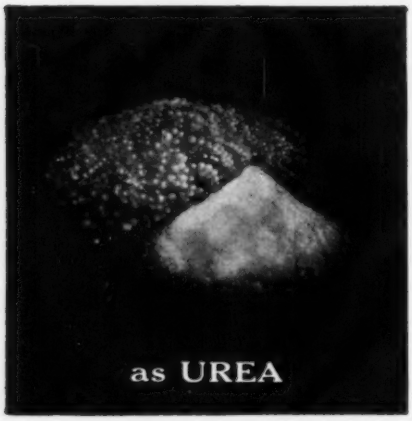
City_____ State_____

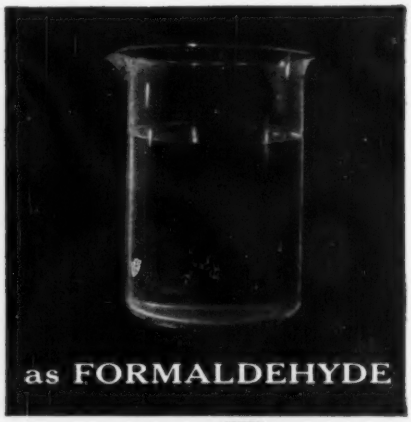
BENTONE®
(Gellants)

Chemical Developments of National Lead Company

BUY UREA AND FORMALDEHYDE WHICHEVER WAY YOU WANT...

separately





or together

Allied Chemical makes it possible for you to buy urea and formaldehyde in whichever form is most convenient for *you*. Separately:

UREA — high-purity crystal and uncoated pelleted, available from *two* producing plants — in South Point, Ohio and S. Omaha, Nebraska.

FORMALDEHYDE — Allied Chemical offers you a full range of concentrations from 37% to 50%.

Or together:

U. F. CONCENTRATE 85 — An easy-to-handle, easy-to-store combination of 60% formaldehyde and 25% urea. Permits larger batches per kettle, shorter cycles, more production from existing equipment.

Write for technical data, prices, delivery information.

For specifications and local offices, see our insert in Chemical Materials Catalog, pages 475-482 and in Chemical Week Buyers Guide, pages 37-44.

BASIC TO AMERICA'S PROGRESS

Allied Chemical

NITROGEN DIVISION
Dept. UF 5-7-3,40 Rector Street, New York 6, N. Y.
(HAnover 2-7300)

Business
Newsletter

CHEMICAL WEEK
June 11, 1960

The "world's largest" polyethylene plant will be built in Puerto Rico—but completion is about a year off. Plans for the venture were revealed by Union Carbide's Morse Dial early this week. Proposed size: 110 million lbs./year.

The high-pressure polyethylene plant will be constructed and operated by a subsidiary, Union Carbide Caribe, near Ponce on Puerto Rico's southern coast. The company now has an ethylene oxide-glycol plant at the location, operating on ethylene from nearby Commonwealth Oil Refinery's by-product gas streams.

Commonwealth will supply additional hydrocarbons for the new Carbide polyethylene plant. Projected size of the installation—which will have the largest initial production capacity of any polyethylene plant in the world—will probably require expansion of Carbide's present ethylene production and purification facilities.

Bulk of the polyethylene will be marketed in Europe and Japan, but some will probably be consumed in U.S. outlets.

•

Three new joint ventures starting this week:

Shell Chemical, Stauffer Chemical, and Western States Chemical are forming a joint subsidiary to produce a line of complex solid fertilizers—mainly granulated ammonium prosphates, also some three-component products containing potash. The yet-unnamed company will put up a plant with more than 50,000-tons/year capacity; it will be adjacent to Stauffer's sulfuric acid plant at Dominguez, Calif., and is to be in operation by next spring. Western States—a fertilizer producer located at Nichols, Calif.—will be responsible for design, construction and operation of the new plant. Shell will supply ammonia, Stauffer will furnish sulfuric acid, and each parent company will market the products under its own name.

U.S. Borax & Chemical Corp. and Lithium Corp. of America are setting up a cooperative arrangement to promote and sell lithium compounds—primarily the carbonate—used in production of glass and ceramics.

American Potash & Chemical Corp. and James H. Rhodes and Co. (Chicago) are teaming up for distribution and technical service on cerium- and rare-earth-based polishing compounds for glass producers. AP&CC will continue to handle export sales of these compounds; Rhodes will take over domestic marketing and will join in a commercial development program.

•

Food Machinery and Chemical Corp. is shifting executives. Succeeding Carl Prutton—who's resigning because of ill health—as chief of the firm's Chemical Divisions is William Williams, who headed the former Westvaco Mineral Products Division. And because of the increasing importance of FMC's chemical operations, it's expected that Chairman Paul Davies and possibly other officers will move from corporate head-

quarters at San Jose, Calif., to Chemical Divisions headquarters in New York.

•

Gearing for long-range butyl rubber demand, Humble Oil will expand its Baytown, Tex., production facilities to 170 million lbs./year from the present 125 million lbs./year. The addition is expected to be ready by second-quarter '61. Just completed at Humble's Baton Rouge, La., plant: a 44-million-lbs./year capacity boost for butyl, with another 40-million-lbs. expansion now under way there targeted for completion in June '61. These expansions will bring Humble's total butyl capacity to more than 350 million lbs./year.

•

Allied Chemical, also planning long-range, will triple production of isocyanates—a main product in the rapidly developing polyurethane foam field—to 25 million lbs./year at its Moundsville, W. Va., plant. There's overcapacity now (*CW Market Newsletter, May 21*), but a 200-million-lbs./year market by '64 is expected. Allied will invest several million dollars in new construction, expand by stages, and looks for mid-'61 completion.

•

Monsanto is expanding its Anniston, Ala., insecticide facilities. A 50% expansion of parathion and methyl parathion will be completed in November. Capacity then: 18 million lbs./year of these products, used on citrus and deciduous fruits, cotton, forage and vegetables. Part of the expansion is the installation of a preliminary activated sludge waste treatment plant where bacterial decomposition will be used to consume about 90% of the organic content in effluent from the entire parathion-methyl parathion production unit.

•

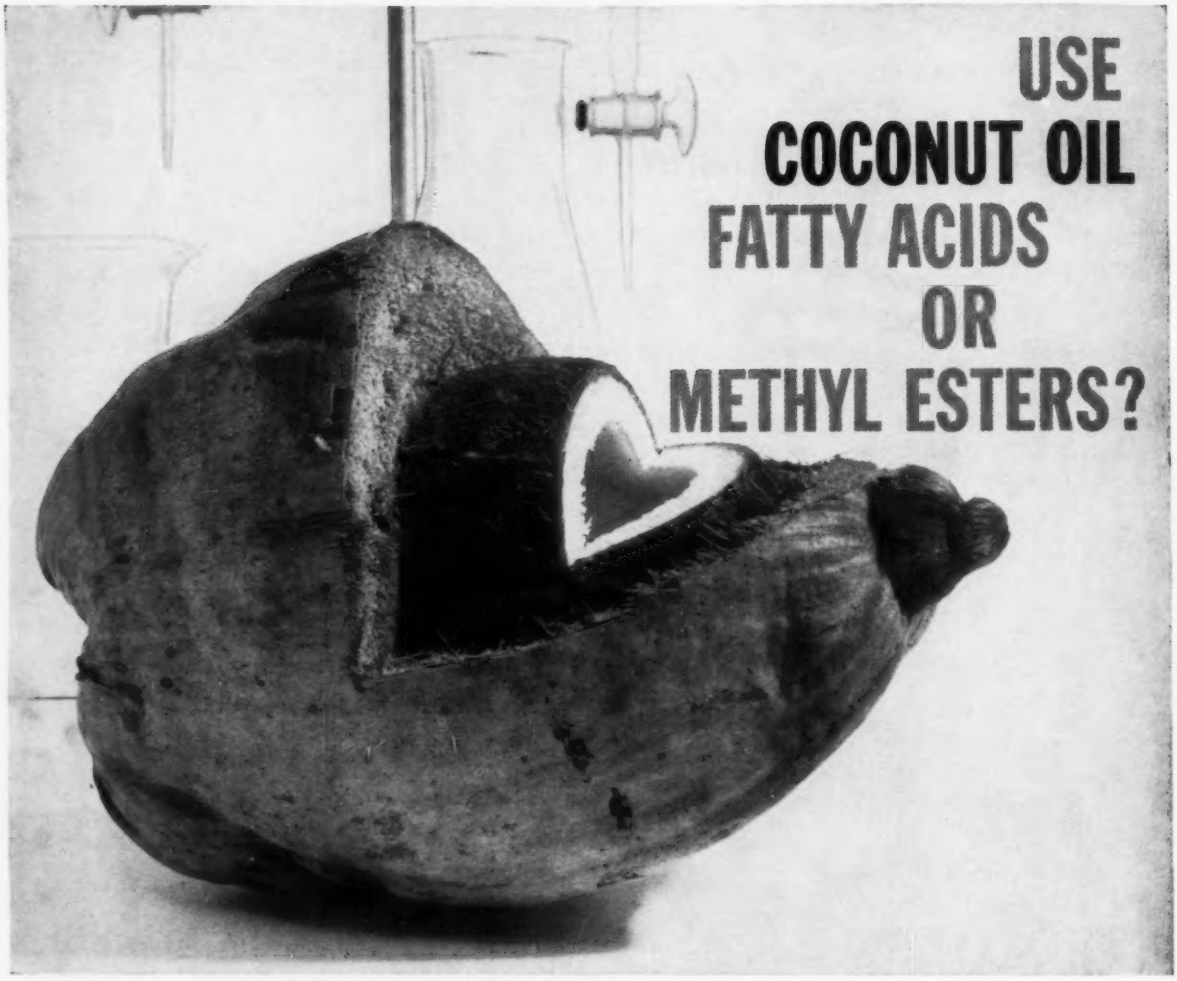
A new petrochemical plant in India may be built by Standard Vacuum or Burmah-Shell, a British firm. Both companies are reported to be readying proposals to build a plant that would supply raw materials for products such as polystyrene and synthetic rubber. Stanvac has a 33,000-bbls./day refinery in Bombay.

•

Private producers in France will get expansion incentives—such as faster write-offs and more credit—as part of two new government economic growth plans. Goal is an annual expansion of national output of 5.5%/year (including 7% for industry) during the next 18 months, and an additional expansion of 22% during the following five years. Many experts doubt the plan will spur investments significantly. The future shape of Common Market competition is the crucial unknown factor.

•

Look for more German chemical projects in underdeveloped countries. West German experts have already surveyed chemical industry potential in countries like Pakistan and the Philippines (*CW, May 21, p. 25*). There's greater likelihood these preliminary moves will be followed up by private capital investments as a result of a new law to be presented in the Bundestag June 22. It's designed to encourage private investments in the developing countries, will be implemented with higher ceilings on exports guarantees, and a boost from $483 to $1.18 billion in the amount of credits insurable against political and economic risk.



Foremost-El Dorado's non-secret ingredient is EXPERIENCE

When you specify Foremost-El Dorado fatty acids or methyl esters, you're buying products from people who are specialists in the field. For over 65 years, Foremost-El Dorado has been producing the highest quality coconut oil products available.

PURITY You can be sure of the highest purity coconut oil fatty acids and methyl esters on the market.

UNIFORMITY The shipment you get today will have the exact specifications as the last lot you ordered.

SERVICE You can relax. On-time delivery is certain. Foremost-El Dorado ships to your requirements—in drums, bags or tank cars. Also mixed compartment tank cars of acids and esters.

If you have any unusual requirements, let our representatives work with you. For the Foremost-El Dorado Agent in your area, write or phone Department C-460

COCONUT OIL	
FATTY ACIDS	**METHYL ESTERS**
Caprylic	*Caproate*
Capric	*Caprylate*
Lauric	*Caprate*
Myristic	*Laurate*
Palmitic	*Myristate*
Cocoleic	*Palmitate*
*Eldhyco**	*Oleate*
Coconut	*Eldo* 18*
	Coconate
	*T. M Reg.

Foremost EL DORADO

FOREMOST FOOD AND CHEMICAL COMPANY

P. O. Box 399, Oakland 4, California

Chemical Week — June 11, 1960

Chatham's Shea, Reading's Newman plunge into petrochemicals.

Starting Over in New Field

Last week's launching of Chatham-Reading Chemical Corp. (New York) strikes a familiar note for many in the industry. It means that Vincent H. Shea—who in one decade built a $25-million phosphorus company and then sold out because he doesn't like to run a publicly owned corporation—is starting anew.

This time he's going into petrochemicals, and he predicts the new enterprise will grow even bigger and faster than the former Shea Chemical Corp., which was acquired by Hooker Chemical Corp. two years ago (*CW, April 26, '58, p. 33*). For principal products — ethylene glycol, ethylene oxide, tetraethyl lead, tetramethyl lead, antifreeze and other automotive specialties, and sulfuric acid—that will put the new firm in competition with the largest companies in the industry, Shea projects total annual sales of more than $50 million.

Contract Letting: Right now, Chatham-Reading is at the point of deciding on process and production plans and on letting a more-than-$20-million plant construction contract. The new plant will go up on a site already being prepared adjacent to its major raw-material source: the 380-million-lbs./year ethylene plant that Mobil Oil expects to bring onstream early next year at Beaumont, Tex. (*CW, March 14, '59, p. 25*). Some units of the Chatham-Reading plant are expected to go onstream late next year, though completion may not come until mid-'62. Bank loans are likely to be the principal financing method.

Up until last month, the predecessor Chatham Chemical Corp.* was a 50-50 partnership started three years ago by Shea and multimillionaire Texas oilman John W. Mecom to look for promising chemical ventures. Then with the Beaumont project fairly well set, except for financing, Shea and Mecom took in another partner: Philadelphia and Reading Corp. (New York), whose energetic young president, Howard A. Newman, has long been eager to get into the chemical field.

As his company put more capital into Chatham-Reading than Shea and Mecom did, Newman becomes chairman of C-R's board of directors, and Executive Vice-President Roger M. Kelly of P & R will be chairman of C-R's finance committee. Shea becomes chairman of C-R's executive committee; and Harold D. McGowan —previously picked by Shea to be Chatham president—will be president and chief executive officer. McGowan was one of the founders of Algonquin Chemical Co., which was acquired by National Distillers and Chemical Corp. (*CW, Aug. 16, '52, p. 40*).

Two Units in Business: Both of Chatham-Reading's operating subsidiaries are already in business: Wabash Chemical Corp. is producing sulfuric acid at a formerly government-owned plant at Kankakee, Ill.; and Houston Chemical Corp.—which will operate the ethylene derivatives plant to be built at Beaumont—has purchased the Automotive Chemicals Dept. of Commercial Solvents Corp. and has been carrying on that business since last week.

This operation, which is expected to provide a major outlet for the ethylene glycol to be produced at Beaumont, includes various chemical specialties that—except for glycol antifreeze compounded and packaged under private-label contracts — are all sold under the Peak tradename. Most important of these is a glycol-based antifreeze containing a rust-inhibitor and other ingredients. Other Peak products: a methanol-based low-cost antifreeze, radiator cleaning and sealing compounds, windshield-wiper fluid, penetrating oil, conditioner, and a car-washing compound.

Sales of these products totaled about $8.5 million last year, but CSC's new management group has been dissatisfied with the profits. The relatively low profitability has been attributed to the fact that CSC—alone among the big companies in the antifreeze field—does not produce ethylene glycol, which constitutes about 97% of commercial antifreezes. Thus sale of this business is expected to benefit both buyer and seller: CSC stands to gain in over-all rate of return, and Chatham-Reading gets important customers for a product line in which it will have a basic position. The transaction in-

* The company was named after Chatham, Mass., a small seaside town near Shea's summer home.

cludes good-will, patents, inventory, sales organization and trademarks, but does not include plants or equipment.

Third for TEL, TML: C-R's Houston Chemical subsidiary shapes up as the third U.S. producer of tetraethyl lead and tetramethyl lead. (Ethyl Corp. and Du Pont have been producing TEL for decades and are building TML plants.) Shea says his company will be producing no more than a tenth of total U.S. output of these antiknock additives, already has contracts to sell to "major gasoline refineries." But he declines to name the prospective buyers, pointing out that they will have to continue to deal with their present suppliers until the new plant comes onstream. Industry speculation is that one customer will be Socony Mobil, whose Mobil Oil subsidiary will be selling ethylene feedstock to Houston Chemical.

For Philadelphia and Reading, the new alliance with Shea provides the long-sought entry into the chemical industry and an investment opportunity for some of that company's liquid assets. This does not affect Reading Chemical Corp., the subsidiary organized earlier this year to try to carry out P & R's plans to produce chemicals from its vast piles of anthracite waste near Pottsville, Pa. Newman says he is talking with "several chemical companies" in an effort to line up a partner for the proposed carbide and gasification project at Pottsville.

For Shea, the signing of contracts with Mobil, Philadelphia and Reading, and Commercial Solvents provides a firm base for building another major chemical company. Right now, he doesn't want to talk about any products except the ones covered by those contracts. But if the new company chooses an ethylene oxidation process that would require a nearby oxygen plant, then it's likely that the by-product nitrogen would be utilized in other products.

And people who know Shea are guessing that he may ultimately want to integrate backward into chlorine and caustic, or forward into ethyl chloride and vinyl chloride—or maybe in both directions, and into polyvinyl chloride, to boot.

The new venture will not be probing virgin markets, but insiders consider the Shea-Newman-Mecom combine an odds-on bet to buck competition from established companies.

Rocket Boost

Chemical companies' stake in the nation's rockets and missiles programs got a $50-million boost last week as the U.S. Air Force and Army awarded development and production contracts to four chemical concerns—Food Machinery and Chemical, Hercules Powder, Thiokol Chemical, and Union Carbide.

The more-than-$20 million worth of contracts awarded to FMC — which will be carrying out this job under a partnership arrangement with National Distillers and Chemical — apparently rounds out USAF's plan to switch its Titan intercontinental ballistic missile from kerosene to chemical fuels (*CW, Feb. 27, p. 23*). The new propellant is expected to be a combination of hydrazine, unsymmetrical dimethyl hydrazine, and nitrogen tetroxide.

In expanded facilities at its Baltimore plant FMC will produce "multi-million-pound quantities" of its Dimazine (UDMH), described as a storable, high-energy, liquid rocket fuel.

Other Components Coming: Last month Olin Mathieson started work on a $15-million contract to build an anhydrous hydrazine plant near its industrial chemicals plant at Saltville, Va. And Hercules is expanding by 300% the capacity of its nitrogen tetroxide unit at Hercules, Calif.

(The Air Force told CHEMICAL WEEK it will buy the nitrogen tetroxide it needs on the open market at competitive bid prices, and that no financial assistance will be offered for expansion of privately owned facilities. This indicates that some of the nitrogen tetroxide business may go to Allied Chemical's Nitrogen Division, which produces the liquid oxidant at Hopewell, Va.)

Thus the stage appears set for supplying all requirements for the Titan's bipropellant — estimated at more than 10 million lbs. of fuel and more than 15 million lbs. of the oxidizer.

Second largest of last week's contracts was a $12-million award to Union Carbide's National Carbon Co. division for research and development work on graphite as a structural material for missile and rocket components. In particular this work will center on use of graphite nose cones. National Carbon has reported considerable growth in use of carbon and graphite as high-temperature structural materials in nuclear and chemical reactors, furnace linings, heat exchangers and other process equipment as well as in jet engines and rockets.

Seeking Plastics Blend: The three-year contract calls for construction of a new research center at Lawrenceburg, Tenn., where most of the development work is to be performed. National Carbon will look into blending graphite with plastics or other materials to find a combination that could withstand re-entry heat for up to 30 minutes, methods to produce large pieces of graphite for nose cones, ways to shorten the time required for manufacturing graphite, and means of improving product uniformity in graphite production.

The Air Force's interest in graphite is said to be due to its high-temperature properties. It gains strength at temperatures higher than 2700 F, and at 6600 F it passes directly from solid into gaseous form.

Hercules gets a $9.2-million Army contract for continuation of its production and planning work on the Honest John artillery rocket and the booster for the Nike Ajax missile—both developed by Hercules and now in operation in the U.S. and abroad. This work is at Radford, Va.

In addition to a $10.5-million contract let in April, a new, $7.3-million continuation contract goes to Thiokol for production of rocket motors and plant maintenance at the Longhorn Ordnance Works at Marshall, Tex.

One other contract awarded late last week in the field of military aeronautics was let to Olin Mathieson Chemical's Energy Division for production of jet starter cartridges at East Alton, Ill. Amount of the contract: $1 million. These cartridges, containing an ammonium nitrate composite propellant, are used in starting jet engines, providing faster startups and enabling jet planes to use smaller landing fields.

Also, in an Air Force-sponsored program, Fairchild Semiconductor Corp. has just signed two contracts totaling $1.5 million with Autonetics, a division of North American Aviation, prime contractor in a reliability improvement program. Fairchild will conduct evaluation studies at Mountain View, Calif., of two transistors based on high-purity silicon.

CHEMICALS UP FOR TRADE CONCESSIONS

Imports into the U.S. *Examples of the hundreds of chemical products on which the U.S. may offer trade-and-tariff concessions to other GATT members*		Exports from the U.S. *Examples of the hundreds of chemical products on which the U.S. may seek trade-and-tariff concessions from other GATT members*
Anthracene, anthraquinone, β-naphthol, 6-chloro-*m*-cresol, *m*-diethylaminophenol, *p*-hydroxybenzoic acid, *o*-nitroaniline, phthalic anhydride*, *o*-toluenesulfonamide, vinyl carbazole, 2,4-xylidine, and numerous colors, dyes, lakes and medicinals.	**COAL-TAR CHEMICALS AND DERIVATIVES**	Benzene, coal-tar acids (including terephthalic), coal-tar intermediates (including styrene), dyes, stains, toners and color lakes, rubber-compounding agents (accelerators, anti-oxidants), toluene, xylene, and other crude and refined cyclic products.
Acetic anhydride, amyl alcohol, butyraldehyde, carbon tetrachloride, cellulose acetate, ethylene glycol, formaldehyde, glycerin, menthol, methyl ethyl ketone, monosodium glutamate, propyl alcohol, propylene chlorohydrin, tartaric acid*, vinyl acetate*, vinyl alcohol*.	**PETROCHEMICALS AND OTHER ORGANICS**	Acids and anhydrides (including naphthenic), alcohols (including glycols), butyl acetate, cellulose acetate, carbon black, fluorinated hydrocarbons, fungicides, herbicides, insecticides, lubricating and fuel oil additives, methyl isobutyl ketones, surface-active agents and detergent intermediates.
Acrylic, alkyd, melamine, polyamide, polyethylene, polyfluoroethylene, rosin ester, silicone and urea resins, mixtures of urea and melamine resins, vinyl acetate resins.	**SYNTHETIC RESINS**	Alkyd (including polyester type), coumarone-indene resins, phenolic and other tar-acid resins, polyethylene, styrene polymer and copolymer, silicones, siloxanes, vinyl and vinylidene polymer and copolymer resins.
Ammonium compounds, barium compounds, calcium hypochlorite, chlorine*, cobalt salts, magnesium compounds, manganese compounds, potash salts*, sodium chlorate, tin compounds, titanium potassium oxalate*, vanadium compounds, zinc sulfide.	**INORGANIC CHEMICALS**	Acids (including phosphoric), aluminum compounds, ammonium sulfate, barium compounds, boron compounds, bromine, dibasic calcium phosphate, gases (compressed, liquefied and solidified), magnesium compounds, platinum salts, vanadium compounds, white phosphorus.
Casein, chicle, crude drugs (such as barks, leaves, roots and seeds), dyeing and tanning extracts, flavoring extracts, gelatin, glue, oils and fats, perfume materials, starches.	**SPECIALTY CHEMICALS**	Antibiotics, biologicals, cosmetics, fire extinguisher compounds, hydraulic fluids, medicinal preparations, radioactive isotopes, soaps and detergents, vitamins.

* Imports into the U.S. in '59 valued at more than $1 million.

Battle Brewing on New Tariff-Cutting Plan

The U.S. chemical industry this week is quietly loading its guns for an attack next month on the government's tentative plan to offer to cut U.S. import duties on hundreds of chemical products. At the same time, chemical companies are also studying how they might be affected by the other half of the government's plan: to seek reciprocal concessions from other nations on another long list of chemicals (see excerpts, above).

Chemicals and allied products make up a large part of both over-all commodity lists that have been drawn up in preparation for next fall's international negotiations under the General Agreement on Tariffs and Trade (GATT) at Geneva, Switzerland. And the imports list includes numerous chemical products that have already been coming into this country in sufficient volume to cause headaches for domestic producers — for instance, cream of tartar, on which U.S. producers last year had vainly asked the government to increase customs rates.

Companies At Bat First: But the industry associations' spokesmen are holding off official comment on these preliminary listings for two reasons. One is to give their member companies time to prepare individual cases for and against the proposed reductions in both U.S. and foreign import restrictions. The other is that industry spokesmen concede that the Administration left off its list of proffered tariff cuts numerous items on which domestic manufacturers had requested that no further import relaxations be made.

The upshot is that there still will be heated protests by divergent segments of domestic industry — manufacturers, processors, exporters, importers, and consumers. Such protests must be filed by June 27 with either or both of two government agencies that will hold at least six weeks of public hearings on the two lists before they are made final.

Two Forums for Complaints: Concurrent hearings will be held by the Tariff Commission and the interagency Committee for Reciprocity Information (CRI), beginning July 11. These two agencies will be working from somewhat different viewpoints:

• The Tariff Commission will be concerned with establishing the so-called peril-points below which U.S. trade agreement negotiators at Geneva must not offer lower U.S. import tariffs. Peril-points are based on present or threatened injury to domestic producers.

• CRI's panel will take testimony aimed at adding items to, or taking items off, the two preliminary lists.

Chemical items on the lists make up the largest single category of products. On the "offer" list are 16 pages with 95 major product groups; on the "asking" list are 10 pages with 84 "basket" groupings. A single grouping may cover scores of products; for example, one "basket" enumerates 25 specific compounds and then adds four clauses that could cover an indefinite number of additional products — "all other glycols or dihydric alcohols; all other hydroxy alkyl amines and alkylene diamines; all other olefin or unsaturated alcohols; homologs and polymers of all the foregoing; and ethers, esters, salts and nitrogenous compounds of any of the foregoing."

Some Organics Exempted: By and large, the government will be asking more concessions than it offers. Specifically left off the offer list are a number of synthetic organic chemicals, such as certain coal-tar products, that the domestic producers have been urging be exempted from further import concessions. The asking list includes practically all chemical items the U.S. sells overseas.

But the election-year political concessions to chemical industry sentiment for more trade protection fall far short of what many chemical company executives want. One leading trade association official puts it this way: "Personally, I am opposed to offering any import concessions on any product that is manufactured and sold in the U.S."

So despite the industry association's reluctance to denounce the plan publicly, a bitter fight over the lists is in prospect. The offer list — in terms of dollar volume — proposes concessions on 65% of the chemical items imported into the U.S.

One of the key controversies is likely to develop over synthetic organic chemicals on the offer list. In New York, the Synthetic Organic Chemical Manufacturers Assn. is proceeding cautiously. Last week, one SOCMA unit — the trade agreements negotiations subcommittee of the International Commercial Relations Committee — held a meeting, appointed a study group to work on the problem. This group will consult member companies, analyze the government's tentative lists, and then make recommendations. One matter to be decided: to what extent the battle in the public hearings during July and August should be left to individual companies, and how vigorously the association should enter the fray.

Probing Drug Decisions

Sen. Estes Kefauver (D., Tenn.) and his subcommittee last week produced not only more headlines on their drug industry probe but also brisk action by the Health, Education & Welfare Dept.

Of primary significance to industry is H-E-W Secretary Arthur Flemming's order for an investigation of all past rulings on antibiotic drugs and of other major scientific decisions that had been made by Dr. Henry Welch, who was chief of the Food & Drug Administration's Antibiotics Division until his recent ouster (*CW Washington Newsletter, May 28*).

Flemming also promised the subcommittee that he will push for new legislation to tighten FDA's control over pharmaceutical production. And a permanent staff of special investigators—responsible only to Flemming —will be appointed to look into any allegations of questionable practices by FDA officials or by companies dealing with the agency.

The Secretary has asked Dr. Detlev Bronk, president of the National Academy of Sciences, to pick his own committee to look into past decisions on antibiotics and to make an initial report within 60 days.

Flemming said Bronk's committee will examine the charges made last week by Dr. Barbara Moulton, who recently resigned after five years with FDA's Bureau of Medicine. She asserted that FDA sometimes placed industry interests above public safety.

Kefauver's subcommittee now is shutting up shop for the political conventions season. Its next hearings—on antibiotics and the government's role in prescription drugs—are set for August.

Big Plants Up for Bids

There's news this week on four potentially valuable chemical plant properties that were developed during World War II and are still under government ownership:

• In what is billed as the last chance to buy plant sites on the Houston (Tex.) Ship Channel, the General Services Administration is inviting bids on the 4,500-acre San Jacinto Ordnance Depot and ammonia works. Bids will be received up to Aug. 1, then opened publicly.

• Another government-owned plant in Texas—the ammonia-nitric acid-nitrate works at Etter, some 60 miles north of Amarillo—is about to be offered for sale. Phillips Chemical Co. has been operating the plant under lease, and owns much of the equipment there. Phillips has the right to make the final bid—which, of course, means that Phillips can buy the plant by bidding just $1 more than any other bidder.

• GSA confirms that General Dynamics Corp. has withdrawn from negotiations on the big plant at Morgantown, W. Va. (*CW Business Newsletter, March 26*). The agency adds that there are no other prospects in sight for this plant, on which the Harry A. Taylor Co. (East Orange, N.J.) is serving as real estate broker.

• The alcohol-from-corn plant at Omaha, Neb.—deserted for nearly a decade—may be sold this month, but apparently not for chemical use. This facility—which had a capacity of 19.5 million gal./year—consists of nine buildings on a 6.5-acre plot. Once valued at $8 million, the plant drew a bid of $3.6 million shortly after the war, but some congressmen were opposed to selling the plant then. More recently, GSA has been asking $850,000. Last week, the agency started considering a bid of $182,500 from Aaron Ferer Corp. (Omaha), a salvage and smelter firm.

Ship Channel Chance: Expansion-minded process companies will undoubtedly consider bidding on one or more of the 41 parcels of land—ranging from 36 to 289 acres—into which the San Jacinto property is split. The ready availability of petroleum and natural gas feedstocks, other chemical and petrochemical products from nearby plants, as well as the water transportation facilities,

are among the weighty "plus" factors.

Nevertheless, CPI people in the Houston area also see negative factors in the offering. They note that there's no restriction on use of the land, so real estate developers might make higher bids than industrial firms would feel are warranted. Also, the government is retaining mineral rights and is holding onto much of the land that actually fronts on the ship channel.

The 110-tons/day ammonia plant, located on a 91-acre tract, is being operated by Smith-Douglass Co. on a lease that runs to '74 unless terminated by S-D in '64 or '69. Purchase of this tract would be subject to terms of that lease. Currently, S-D is paying a rental of $134,000/year; but after a $1.7-million expansion outlay is amortized in '64, rental will revert to the original $350,000/year.

Proxy Fight Flops

This week Industrial Rayon management—having won a 6-to-1 vote of confidence from stockholders at the company's annual meeting—is trying to stem the flow of red ink that has colored IRC's books the past few months.

But it remains to be seen whether management—which still seeks merger as part of its intensified program of diversification to balance big Tyrex losses—will be able to carry out its program if there's continued opposition from the insurgent stockholders who spiked the proposed merger with Texas Butadiene & Chemical (*CW Business Newsletter, May 7*).

Newly elected President Frederick L. Bissinger told shareholders that profitable operation is anticipated by this year's fourth quarter, and that the break-even point should be achieved during the third quarter.

But second-quarter losses, he said, might even exceed the $504,134 loss of the first quarter. Contributing factors: curtailment at the Cleveland tire cord and yarn plant, and unusual startup costs of the company's new bulked nylon filament yarn and polypropylene fiber plant at Covington, Va.

Immediate steps toward recovery of losses, as outlined by Bissinger:

- Doubling of capacity at IRC's Nylon Division plant for Nyloft bulked filament yarn. Reportedly use of this yarn has been gaining in carpet manufacture.
- Further development of Prolene polypropylene fiber. This product is now produced in limited commercial quantities mainly as cordage. IRC plans to eventually produce it in staple and filament for the apparel field.
- Further cost-cutting in production of Tyrex tire cord. This month, manufacturing process improvements are being put into operation at Painesville, O. Such improvements, if significant, could be a key factor in the future of Tyrex.

Overseas Opportunities: And the company plans increased emphasis on overseas ventures. Established early this year: Irco AG., a wholly owned subsidiary in Switzerland to sell technical know-how. And the firm reportedly is negotiating for possible building of rayon and other fiber plants abroad.

Bissinger told stockholders that Industrial Rayon would continue strong efforts at diversification. Despite recent losses, the company is still in a position to make substantial acquisitions, but the chief executive declined to comment on such plans.

Pitfalls for Poland

Poland's political boss, Communist party leader Wladyslaw Gomulka, is out to step up industrialization by boosting capital expenditures. Any such buildup is sure to mean greater pressure on the chemical plant construction industry, which already plays a major role in Poland's industrial plan. But unless some serious problems in that industry are solved, there's good reason to doubt that the industry will be able to deliver the goods.

Thus far Polish chemical production is expanding rapidly—faster, in fact, than any other industry sector. Last year output was up 17.5%, according to the Polish government, and in the first quarter of this year it was 21.2% higher than in first-quarter '59.

But construction of chemical plants, vital to maintaining this rapid chemical growth, is lagging. The bottleneck is becoming especially apparent in basic chemicals, dyes, enamels and oxygen. The list of plant startup delays is a long one. A few samples: butanol and octanol production at the Oswiecim combine has been delayed, won't start until mid-year; the Oswiecim carbide furnace, slated to start up in mid-'59, didn't get into operation until April '60; production of synthetic fibers at Tarnov was delayed two months because the chlorine department wasn't finished on time; and startups were delayed at the Rokita Works oxygen plant (causing a national shortage), the Torun sulfuric acid facilities, the Bydgoszcz phenol plant, the Dedzierzyn phthalic anhydride unit and the Tarchomin antibiotics plant.

At the Bottom: Chief cause of these delays, according to Bronislav Taban, deputy minister for the chemical industry, is slowness on the part of designers. It takes so long for plant builders to get blueprints that they have on occasion begun construction before getting the detailed plans.

Taban has ordered this practice stopped. He is pushing for more standardized designs. And construction time, rather than expenditures, is now the criterion of a program's fulfillment.

But a more basic reason for the construction snags may be that while more and more chemical equipment is being produced in Poland, less and less of it is reaching domestic producers. Demands from other Soviet bloc members get priority. In '56, 6.9 million metric tons of Polish-made chemical equipment was slated for the home market. The total dropped continuously to 5.8 million tons in '57, 4.4 million in '58, and 4.3 million last year.

And to fill their equipment needs, Polish industry managers have had to increase their purchases abroad. From $12.7 million in '57, equipment imports have risen steadily to $17.2 million last year, will hit an estimated $18.7 million in '60.

Greater expenditures in the capital goods industry may help ease Poland's chemical equipment ills. But this in itself isn't a cure. Poland's decision to stress capital equipment production at the expense of consumer goods reflects Gomulka's hardening political line. There is good reason to believe that a harder line is also shaping up in Moscow. That could mean even greater Russian stress on its own basic industry and greater pressure on Soviet satellites to help fill Russian needs.

COMPANIES

Flintkote Co. (New York) has acquired the Sealzit Co. (Riverdale, Calif.) for more than $1 million cash. Sealzit manufactures guns and accessory equipment for applying resins, binders and plastics in production of boats, trailers and furniture. A newly developed Sealzit gun is used for Flintkote's new Monoform System of roofing.

•

Olympic Chemical Co. (Greensboro, N.C.) will start producing urethane foams July 1 in the former Revolution Rayon plant at Greensboro. Cone Mills Corp. has a controlling interest in the new firm headed by Robert W. Ward, formerly with Nopco Chemical Co.

•

Seaway Steel Corp. (Buffalo, N.Y.) is bringing the nickel-processing operation of New Jersey Metal Co. (Elizabeth, N.J.) to the old Buffalo Bolt plant (Tonawanda, N.Y.). The move follows formation of a new Seaway Steel subsidiary, Seaway Nickel, which acquired all assets of New Jersey Metal. Seaway Nickel will manufacture and sell rolled nickel anodes used in nickel plating. Rolling facilities of Seaway Steel in Niagara Industrial Park will be used by the new nickel-processing subsidiary.

•

H. K. Porter Co. (Pittsburgh, Pa.) has acquired Allied Paint Mfg. Co. (Tulsa, Okla.). Allied Paint will become the Tulsa Works of Porter's Paint Division; Ainslie Perrault, previously president of Allied Paint, will serve as works manager. Costs were not disclosed.

•

Witco Chemical Co. stockholders have approved an increase of the company's authorized common stock from 1 million to 2 million shares. Payment date for a 50% June stock distribution, voted by the board of directors, is set for June 15.

•

Sylvania Electric Products Inc., subsidiary of General Telephone and Electronics Corp. (New York), has purchased a "substantial part" of Corning Glass Works' interest in Sylvania-Corning Nuclear Corp. (Sylcor). Up to now, Sylcor—a leader in research, development and production of fuels for nuclear reactors, with offices and facilities at Bayside, N.Y.—has been owned 50-50 by Corning and Sylvania.

EXPANSION

Cellulose: Buckeye Cellulose Corp. (Foley, Fla.) is increasing capacity for bleached kraft and dissolving pulps by 33,000 tons/year—13% higher than the current capacity of 260,000 tons/year. It's the company's third expansion in three years and follows a $20-million expansion last year when a second production line was added. Buckeye also operates a 115,000-tons/year cotton linter pulp mill in Memphis.

Gypsum: United States Gypsum (Chicago) will build its seventh gypsum plant on the Eastern seaboard at Baltimore. Options have been taken on a site at Marley Neck near the U.S. Quarantine Station. Construction will begin in early '61, with completion targeted for early in '62.

•

Industrial Alcohol: Rocky Mountain Chemical Corp. (Rupert, Ida.) is shipping the industrial alcohol plant of Yates and Anderson (Salt Lake City) to Rupert, where it will become part of a $500,000 processing complex. Planned capacity: 1 million gal./year of industrial alcohol from processing "cull" potatoes.

•

Pesticides: Niagara Chemical Division of Food Machinery and Chemical Corp. is building a plant in Greeley, Colo., to make a wide range of pesticides.

FOREIGN

Sales/West Germany: West Germany's chemical industry racked up sales of $1.3 billion during the first three months of '60. The quarterly total includes the Saar industries for the first time. But even excluding the Saar, the industry scored a 20% rise over first-quarter '59. The industry price index was down 1.5% from the '59 period. Prices dropped 7% on organic chemicals, which scored the biggest sales rise—23%.

•

Equipment Orders/Russia: Western equipment producers can expect more big orders from the Soviet Union. Russia plans a huge expansion of cellulose and paper production. It will build 16 large cellulose and cardboard plants in the northern timber belt. Other new plants will make a wide range of materials. Bulk of the equipment will be imported. Inquiries for British and German equipment have already gone out.

•

Polyvinyl Butyral/Belgium: Monsanto has formed a joint subsidiary with Societe Industrielle de la Cellulose (Sicac) to build a plant in Ghent for producing polyvinyl butyral sheets. Construction is to start immediately, with production slated for '61. Monsanto acquired a minority interest in Sicac in '47 in exchange for its cellulose acetate sheet process, and holds majority interest in the new venture. Earlier last week Monsanto revealed plans to produce fluorocarbons in Australia (*CW Business Newsletter, June 4*).

•

Mining/Venezuela: The Venezuelan government has declared all deposits of nickel, bauxite and manganese ore closed to exploration and exploitation by private interests.

•

Columbium/Brazil: Molybdenum Corp. of America and Wah Chang Corp. will build a columbium concentrating mill in Brazil at their jointly owned deposits.

Air Reduction's Polyvinyl Alcohol Plant, Calvert City, Ky.

AIRCO®

AIRCO CHEMICALS FROM ACETYLENE · VINOL POLYVINYL ALCOHOL · VINYL ACETATE · VINYL STEARATE · SURFYNOL NONIONIC SURFACE ACTIVE AGENTS AND DEFOAMERS · KYRAX–A SYNTHETIC WAX ACETYLENIC ALCOHOLS AND GLYCOLS

AIR REDUCTION CHEMICAL COMPANY • A DIVISION OF AIR REDUCTION COMPANY, INCORPORATED • 150 EAST 42ND STREET, NEW YORK 17, N. Y.

AIRCO

VINOL

POLYVINYL ALCOHOL TAILORED FOR SPECIFIC INDUSTRIAL USES

A section of Airco's Chemical Development Laboratory.

Airco VINOL polyvinyl alcohol is offered in 9 versatile grades, each with properties tailored for specific applications in such varied fields as adhesives, textiles, paper, plastics, ceramics, cosmetics, paints and photoengraving.

Textile applications include warp sizing for a variety of fibers, sizing for nylon hosiery yarns, ingredient in various types of finishes, and binder for non-woven fabrics and ribbons. In the paper field, polyvinyl alcohol is used as a coating and surface size for paper and paperboard.

Among plastics applications are molded products, water-soluble films; films with special properties such as resistance to grease, solvents and gases; film for mold release in plastics manufacture; foams and sponges. A number of specialty applications exist in many areas—binders for ceramics; emulsifiers and thickeners for emulsions; protective coatings for metals and plastics; quenchant for steel. And the adhesives industry consumes large quantities in compounding many products.

Wide Range of Properties

VINOL resins are white powders, differing from each other in degree of hydrolysis and polymerization. These structural differences account for the differences in properties, and provide a wide range of characteristics such as water solubility or water resistance, adhesion to porous or non-porous surfaces, toughness, flexibility. Other key properties are resistance to grease, solvents, rotting and tearing.

While VINOL grades represent a range of properties, all dissolve easily in water and form colorless solutions; all have little tendency to dust.

Super Hydrolyzed VINOL 125

One of the 9 VINOL grades—VINOL 125—is unlike any other polyvinyl alcohol produced in this country. It is super hydrolyzed: 99.85+ percent hydrolyzed. Because VINOL 125 has fewer residual bulky acetate groups, films cast from solutions of VINOL 125 generally show markedly greater water resistance and less swelling in water than films cast from "completely" hydrolyzed polyvinyl alcohols. Yet VINOL 125 dissolves readily in hot water.

VINOL 125 will be the first grade available in commercial quantities. Until VINOL 125 is available, limited amounts of a polyvinyl alcohol with the same special properties but coarser in particle size are being supplied for preliminary evaluation. The fully hydrolyzed grades—VINOL 260, 230, 205—are expected to be available late in 1960, followed by the non-gelling and partially hydrolyzed grades. When grades approach the marketing stage, technical literature will be issued and samples distributed.

Largest Source of Polyvinyl Alcohol

Airco's 20-million-pound-per-year VINOL plant at Calvert City, Kentucky, is the U. S.'s largest and most modern installation producing merchant polyvinyl alcohol. It employs an exclusive continuous process which turns out resins of consistently high quality, free from variations often unavoidable in batch processing. And quality is further assured since the VINOL plant is part of Air Reduction's integrated acetylene chemicals complex with all steps—including acetylene and vinyl acetate monomer manufacture—under its control.

Technical Service

Airco's technical service laboratories are available for assistance in using VINOL resins in formulations and processing.

An experienced adhesives applications staff is at work at the technical service laboratory of the Colton Chemical Company, Division of Air Reduction Company, Inc., in Cleveland. Manufacturers interested in adhesives are invited to address their inquiries to this laboratory.

Properties of VINOL Polyvinyl Alcohol

GRADE DESIGNATION	SUPER HYDROLYZED	FULLY HYDROLYZED			NON-GELLING		PARTIALLY HYDROLYZED		
	VINOL 125	VINOL 260 *	VINOL 230 *	VINOL 205 *	VINOL 350 *	VINOL 325 *	VINOL 540 *	VINOL 523 *	VINOL 505 *
VISCOSITY, CPS 4% SOLN., 20° C	24-28	55-65	28-32	4-6	45-55	23-28	35-45	21-25	4-6
PERCENT HYDROLYSIS	99.85+	99 min.	99 min.	99 min.	97.7-98.4	97.7-98.4	87-89	87-89	88-89

*Tentative specifications for grades which are scheduled for later production. Batch process polyvinyl alcohols resembling most of these grades are currently available from Colton Chemical Company.

VINOL is the trademark of Air Reduction Company, Incorporated, for its polyvinyl alcohol.

VINYL MONOMERS

Consumers throughout the country can count on all the vinyl acetate monomer they need from Airco. Two modern plants at Calvert City have a total capacity of 90 million pounds a year. To guarantee prompt deliveries on the West Coast as well as east of the Rockies, Airco operates bulk storage supply depots at Richmond and Vernon, California. Purity of the monomer is uniformly 99.9+ percent and Airco vinyl acetate shows consistent characteristics in polymerization reactions.

Vinyl stearate, a long-chain monomer, is a valuable tool for building such properties as flexibility and enhanced water resistance into copolymer resins.

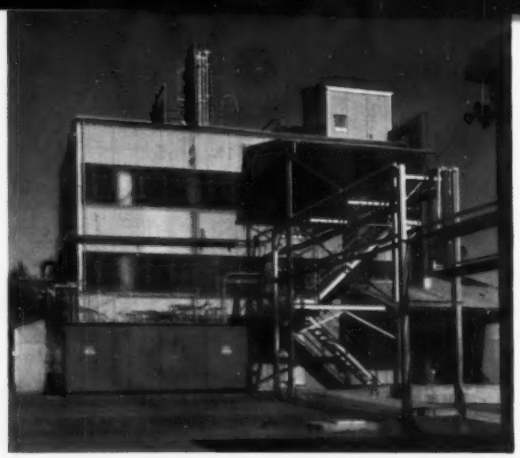
MONOMER	BOILING POINT °C	MELTING POINT °C	SPECIFIC GRAVITY 20/20	APPLICATIONS
VINYL ACETATE	72.5 (760 mm)	−100.2	0.9342	Emulsion and bead polymers used widely in adhesives, paints, textile finishes, and other coatings. Intermediate for polyvinyl alcohol and polyvinyl butyral.
VINYL STEARATE	175 (3 mm)	28-30	0.9037	Internal plasticizer in copolymerization with vinyl acetate, vinyl chloride and other monomers for resins used in paints, adhesives, paper coatings; textile finishes; chewing gum base; fabrication of pipes, sheets, tubes.

SURFYNOL Nonionic Surface Active Agents and Defoamers

These unique ditertiary acetylenic glycols combine surface active and defoaming properties not found in other nonionics. They show synergism with other surface active agents, whether nonionic, anionic or cationic: most combinations of SURFYNOLS and another surface active agent have greater activity at a given concentration than either material alone at the same concentration.

The 100% active solid SURFYNOLS, 82 and 104, show excellent high temperature stability.

TRADE NAME	CHEMICAL COMPOSITION	% ACTIVE BY WEIGHT	SURFACE TENSION 0.1% AQ. SOLN., DYNES/CM, 25°C	APPLICATIONS
SURFYNOL 104	Ditertiary acetylenic glycol	100	31.6	Increased wetting and low foam with other surface active agents; defoamer in aqueous systems; rinse-aid surfactant.
SURFYNOL 104A	Solution of 104 in 2-ethyl hexanol	50	33.0	Defoamer in emulsion systems for paints, paper coatings and textile finishes; insecticide formulations; low-foam detergents.
SURFYNOL 104E	Solution of 104 in ethylene glycol	50	36.2	
SURFYNOL TG	Mixture of ditertiary acetylenic glycol, alkyl phenyl ether of polyethylene glycol and ethylene glycol	83	27.6	Pigment dispersion in emulsion paints and other pigmented aqueous systems.
SURFYNOL 61	Dimethyl hexynol	100	32.4* *1.0% aq. soln.	Volatile wetting agent for paper coatings, floor polishes and glass cleaning formulations. Viscosity reduction.
SURFYNOL 82	Dimethyl octynediol	100	55.3	Viscosity reduction in vinyl plastisols and aniline inks. Cosmetic ingredient. Low-foam wetting agent in developer compounds. Defoamer in electroplating baths.



One of Airco's chemical pilot plants

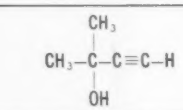
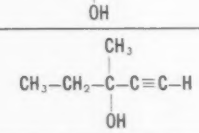
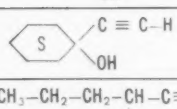
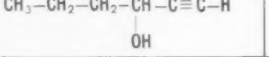
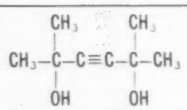
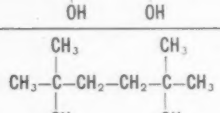
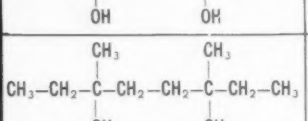
KYRAX A Synthetic Wax

(Polyvinyl ester)

APPLICATIONS: Component of wax polishes and finishes for metal, leather, wood and paper; aerosol coating formulations. Mold release agent. Plasticizer.

Acetylenic Alcohols and Glycols and Derivatives

These specialty chemicals, previously not available except on a laboratory scale, offer rewarding opportunities for research and development in many fields. They are produced in commercial quantities in a continuous process plant at Calvert City, and at Bound Brook.

	STRUCTURAL FORMULA	BOILING POINT °C, 760 mm	MELTING POINT °C	SOLUBILITY in H_2O wt. % at 20°C	APPLICATIONS
METHYL BUTYNOL		103.6	2.6	miscible	Stabilizers in chlorinated solvents. Viscosity reducers and stabilizers. Electroplating brighteners. Intermediate in synthesis of hypnotics and isoprenoid chemicals such as Vitamin A, ionone and perfume alcohols. Solvents for alcohol-soluble nylon and polyamide resins.
METHYL PENTYNOL		121.4	−30.6	9.9	
ETHYNYL CYCLOHEXANOL		180	30-31	1.2	Corrosion inhibitor for mineral acids. Stabilizer in chlorinated organics. Synthesis of hypnotics, other pharmaceuticals and perfumery materials.
HEXYNOL		142	−80	3.8	Corrosion inhibitor for mineral acids; high temperature oil well acidizing inhibitor.
DIMETHYL HEXYNEDIOL		205-6	94-95	27.0	Component in wire drawing lubricant formulations. Coupling agent in resin coatings. Organic synthesis.
DIMETHYL HEXANEDIOL		214-15	87.5-89	14.3	Synthesis of peroxide catalysts and cross-linkers, cyclic musk compounds and allethrin.
DIMETHYL OCTANEDIOL		241-42	44	11.7	For investigation as highly alkaline stable low foam surfactant; high temperature solvent and component of lubricants, cutting oils.

Other Acetylene Derivatives

The following products, also available commercially for the first time, are produced in commercial quantities at Bound Brook:

Methyl Butenol (2-methyl-3-buten-2-ol)	Dimethyl Octanol (3,6-dimethyl-3-octanol)	Ethynylene Dicyclohexanol (bis[1-hydroxycyclohexyl]acetylene)	Ethyl Acetylene (1-butyne)
Methyl Hydroxy Butanone (3-methyl-3-hydroxy-2-butanone)	Methyl Pentanol (3-methyl-3-pentanol)	Methyl Acetylene (propyne)	Isopropenyl Acetylene (2-methyl-1-buten-3-yne)

For complete technical data and samples, write to:

AIR REDUCTION CHEMICAL COMPANY

A Division of Air Reduction Company, Incorporated
150 EAST 42ND STREET, NEW YORK 17, N. Y.

SALES OFFICES
Berkeley, California
Charlotte, North Carolina
Chicago, Illinois

PLANTS
Calvert City, Kentucky
Bound Brook, New Jersey

TECHNICAL SALES LABORATORY
Bound Brook, New Jersey

Printed in U.S.A. ARC-X2 5-60-225 M

Rubber Corp. President Merton tells what it's like when a . . .

U.S. Firm Gets German Parent

When Rubber Corp. of America begins market-testing German plastics here next month, as the U.S. operating arm of European chemical interests, its activities will add a fresh facet to international chemical business. How it fares may be a deciding factor in whether other U.S. firms become similar agencies.

RC's new owners—holding 60% of the stock—are Dynamit-Nobel AG., which will steer the firm's technological efforts, and Swiss toolmaking firm Oerlikon-Buehrle, which will exercise financial control. Remainder of the company is owned by family interests of German-born William Merton, founder and president of the company.

Although subsidiaries of foreign chemical firms in the U.S. are not uncommon, most are owned jointly with American producers or were started as totally new, wholly owned companies. RC differs from these as an outright purchase of a going concern for operating purposes.

Foreign control is not entirely new to Rubber Corp., since the majority of its stock was held previously by two British investment banks. Now, however, the company will no longer be purely a financial interest of foreign firms, instead will become an outlet for German technology and products. Dynamit's technological command is expected to change RC's operational outlook, was an underlying reason for the acquisition.

How It Happened: About three years ago, Rubber Corp. President William Merton began to realize that expansion of his company was the key to competitive survival. The company's English investors, however, were reluctant to finance expansion, largely because they had little or no technical proficiency. Compounding this, RC wanted additional technical assistance from an established corporation.

Why European Control: Becoming a "foreign" company would be easy for RC. Merton, of course, is not hampered by a language problem and he "understands the European way of doing business," something he feels most American firms don't fully comprehend. Even though RC is a 30-year-old American company, Merton believes its approach to business is "really European."

Merton considered several courses before selling abroad. First, he figured that the company's chances of success under public ownership would be only slightly improved. Second, he thought, a merger with another company of similar size and experience would not greatly enhance RC's technical assets. Moreover, he was certain that larger U.S. chemical firms would have no interest in buying RC, and a large corporation out of the field wouldn't have desirable know-how in plastics. In Merton's logic a European corporation was the answer.

The Course: Once contact was established Oerlikon-Buehrle and Dynamit spent a good deal of time pinpointing entry into the U.S. markets. Although Dynamit is one of the biggest European producers of plastic intermediates and finished products and has a big export business, it has developed few U.S. outlets. Says Merton, "Dynamit hasn't followed U.S. technical developments as it should. Now it's getting a window in the U.S."

For its part RC will start out by market-testing Dynamit's polyvinyl chloride plastics. "Our biggest prob-

lem now," according to Merton, "is picking the right products."

Pros and Cons: Once salable products are decided upon, production in the U.S. will be started. Engineers from both companies are now blueprinting expansions of facilities at RC's Long Island property.

The company has full use now of Dynamit's technical personnel and of technology covered under cross-licensing agreements that Dynamit holds. As for financial aid, Merton says, his company will be like a division of any large company: "There's a lot of money there, and we'll have to justify getting it . . . but without them we can't invest."

No Loss: Merton thinks RC lost nothing in the maneuver. He points out that the company lost no equity, gave up only a little technical control. And, he adds, the new fields opened to him are much broader than before. "Ultimately, the sky's the limit," he says, "although first we must gain our owners' confidence."

Rubber Corp. of America will retain its name, although the bulk of its business has been in polymers, plasticizers and other esters, calendered film, and sheeting and plastic intermediates.

Merton won't say what amount of money exchanged hands, but there's little doubt it was a multimillion-dollar deal. In '59, RC sales were some $12 million, including those of a rubber business it has since spun off. This year it expects sales to be about $8 million.

Foreign Feeling: RC was looked at for purchase by other companies before the deal was set. "But what they offered was money, not experience," Merton recalls, "and we were in sound financial position."

What RC got, he feels, was a bigger product potential, and a boss who is 4,500 miles away. "They'll rely on our management, won't dictate too much," Merton says, because "they've found a countryman here who understands their business."

Now the company will assume a European aspect, Merton predicts. "Our influence will be judged by what's behind us, and we will be looked at differently by customers, suppliers and competitors," he says. Employees are expected to welcome the change, and "we may even merchandise that fact," he says.

New Radiation Guides

Last week the U.S. Public Health Service's Federal Radiation Council reported to Congress that it is working on a new statement of the principle of radiation protection. Tentatively, it states radiation dosage should be kept as far as possible below the amount "that should not be exceeded without careful consideration."

Public sensitivity to potential radiation hazards continues strong. At Vanderbilt University, for example, a panel of scientists agreed recently that the fear held by many persons of exposure to radioactive materials is "unreasonable and without basis in fact."

"A state of nuclear neurosis exists," says George White, one of the panelists and general manager of General Electric Co.'s atomic power equipment department.

The scientists think the fears are unreasonable because there are many ways of controlling radioactivity.

Illustrating how strongly the public feels is a situation at Falmouth, Mass. A proposal for a nuclear research center at the U.S. Army's Camp Edwards near Falmouth is running into trouble because residents fear the center would turn into a "nuclear factory" with large amounts of radioactive waste. Cape Codders are exploring possibilities of damage to property values if the center is built.

And in Buffalo, N.Y., the chairman of the water pollution committee of the New York State Conservation Council warned a few days ago that disposal of liquid atomic wastes in old salt mines of western New York would present a grave threat of contamination of water supplies. State officials have proposed this disposal idea as part of a program for developing atomic industry in New York.

Clearing the Air

Community relations and the legal aspects of air-pollution control ranked high on the list of topics covered in last week's meeting of the Air Pollution Control Assn. in Cincinnati. Representatives from chemical process firms figured prominently in the proceedings.

From American Cynamid, for example, came Charles McHenry, industrial hygienist of the company's Central Medical Dept., and Hoyt Charles, agriculturalist from the Brewster, Fla., triple superphosphate plant. The two reported on the success of the company's monitoring program that measured background levels of the fluoride contamination in the air before Cyanamid built its plant in '56.

They said that preconstruction data, used for comparison with current levels, have proved to be an "indispensable tool in determining control measures necessary for maximum production without air pollution."

Cyanamid will make its monitoring data available to government and industry in the area, has already used some of it in local community relations programs. The presence of nine phosphate producing plants has made area residents especially sensitive to pollution matters.

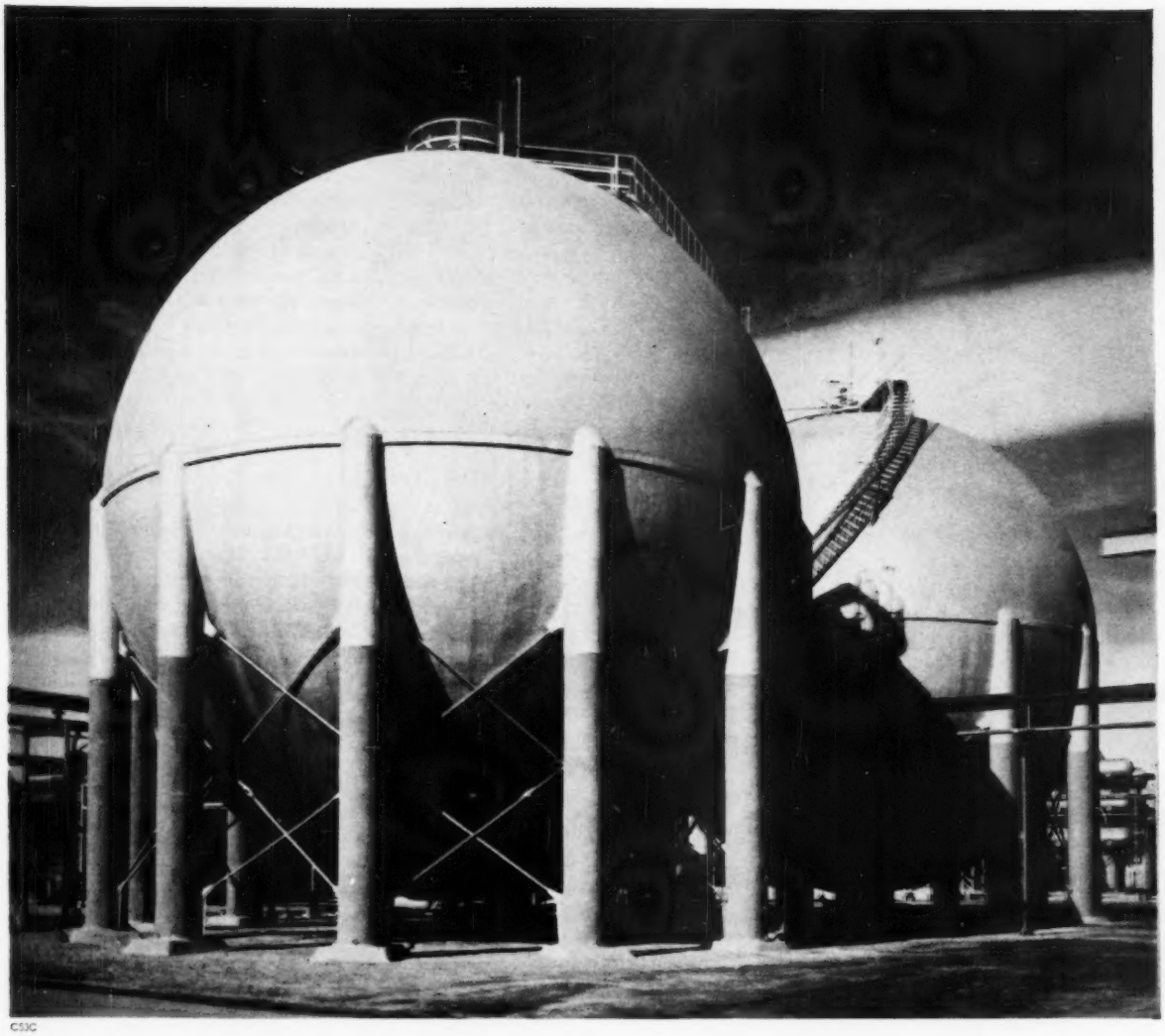
Legal and Local: Also getting attention were legal and enforcement problems connected with air pollution. "Unrealistic legislation may boomerang," said G. A. Lloyd, coordinator of public affairs for Humble Oil's Standard Division, "if carelessly drawn controls are enacted without realistic examination of all the facts." He pointed out that unnecessary controls can lead to a loss of public confidence in the efforts of both public officials and industry.

George Best, of the Manufacturing Chemists' Assn., suggested that administrative control of air-pollution programs be placed at the local level. Cooperative services would be rendered by higher levels of government as the problem at hand progressively affected more groups. Best thinks that "local authorities can be more effective, especially in obtaining progress through cooperation—and better able to gauge the speed with which corrective measures should be paced."

Mexico Pushes Gases

Liberal tax moratoriums and cancellation of import duties have been ordered by the Mexican government to encourage production of high-purity argon and nitrogen in Mexico. Companies that seize the opportunity must agree to produce them in both gaseous and liquid forms with minimum purities of 99.995% for argon and 99.99% for nitrogen.

Producing companies are promised



C53C

Twin Hortonspheres Store Anhydrous Ammonia

United States Steel Corporation's nitrogen products plant near Provo, Utah, produces chemical fertilizers and industrial acid.

Built at the site of U. S. Steel's Geneva Works, the chemical facility utilizes coke oven gas recovered from steelmaking process to produce anhydrous ammonia. In its liquid form, the product is stored at approximately four times atmospheric pressure in the twin Hortonspheres shown above. Designed, fabricated and erected by CB&I, each structure is 60 ft. in diameter and has a 2,100-ton capacity.

Wherever chemical products are processed or stored, you'll find CB&I *Craftsmanship in Steel*. For details write our nearest office.

CHICAGO BRIDGE & IRON COMPANY

332 SOUTH MICHIGAN AVENUE
CHICAGO 4, ILLINOIS

OFFICES AND SUBSIDIARIES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

some tax breaks for seven years. Exemptions: 100% of import duties on machinery, equipment and certain supplies; 100% from sales and stamp taxes; and 20% on income for tax purposes.

Two companies have recently started production of argon. They are Argon de Monterrey, S.A. (Monterrey), which has backing from National Cylinder Gas Co., and Argon, S.A. (Mexico City), which has the Smith Bros. Welding distributorship in Mexico.

Companies applying for the tax exemptions must also agree to offer a minimum of 50% of their production for general sale. This prevents a firm from seeking tax advantages for captive production.

CHEMICAL WEEK's reporters in Mexico asked industry observers there what factors have produced the unprecedented accent on argon and nitrogen. Answer: a mushrooming demand for the gases as blanketing agents in the welding of metals, particularly steel and aluminum. With record industrial building scheduled, domestic producers are unable to fill orders.

Other chemical activities in progress in Mexico:

Carborundum Co. will build an abrasives plant to use Mexican raw materials. Miles Laboratories is beginning construction of its citric acid plant (*CW, April 2, p. 14*) near Cuernavaca in the state of Morelos.

A Mexican company is looking for proposals from other firms to merge with it or to join in much-needed expansion. Beisa, S.A., Mexican manufacturing affiliate of Schering Corp., produces hormone intermediates, is reportedly interested in moving further into pharmaceuticals, or high-value chemicals.

LABOR

Pigment Pact: Following on-again-off-again negotiations, Local 4-23 of the Oil, Chemical & Atomic Workers and management of Acheson Dispersed Pigments Co.'s Orange, Tex., plant have reached a settlement under a wage and fringe benefits reopening clause. The agreement calls for an across-the-board wage increase of 10¢/hour and extension of an insurance agreement for one year without an increase in contribution by the company. The contract is for three years from March 1, '59. Settlement had apparently been reached some weeks ago, but strikers turned it down, then accepted it, then briefly disputed it again just prior to settlement.

•

Paper Contract: A new one-year contract calling for a package increase of 12.5¢/hour has been worked out between two pulp and paper unions and the Pacific Coast Assn. of Pulp and Paper Manufacturers, which represents 18 companies. The agreement, covering 20,000 members of the United Papermakers and Paperworkers Union and the International Pulp, Sulphite and Papermill Workers, becomes effective June 1, provides increases of base pay rates to $2.19½/hour for men, $1.88½/-hour for women. In addition a liberalized health and welfare program will be paid for entirely by the companies. The agreement affects workers in 44 plants from Washington to California.

•

Engineer Union: Union organizing among professional engineers was dealt a sharp blow when a worldwide unit of Western Electric Co. engineers rejected labor union representation. Observers speculate that the loss may force union leaders to change the type of campaigns they use in trying to unionize professional people, may even herald the end of engineering unionism.

The election held among 51 Western Electric units in 14 states and 20 locations abroad was the largest representation vote ever conducted among professional employees by the National Labor Relations Board. The union involved was the Council of Western Electric Professional Employees National, an affiliate of the Engineers and Scientists of America. The tally: of 6,750 professional engineers eligible to vote, 3,970 voted against and 2,603 voted for.

•

Phosphate Hike: Swift & Co. management at the firm's Bartow, Fla., phosphate plant has settled a three-year contract with Local 38 of the International Chemical Workers Union. The pact, to run until May 15, '63, calls for pay raises of 6¢/-hour in lower wage brackets and 8¢/hour in higher brackets with an automatic 5¢/hour increase effective May 15, '61.

•

Glass Switch: United Glass Workers Union representing 9,500 flat-glass workers of Libbey-Owens-Ford Glass has agreed to replace a two-year contract due to expire next October with one that expires Oct. 26, '61. The contract provides expanded fringe benefits covering employees in plants at Toledo, O., Charleston, W. Va., Shreveport, La., and Ottawa, Ill.

•

Canadian Paper: A one-year contract calling for general increases ranging from 15 to 28¢/hour for 1,100 employees of Ontario Paper Co., Ltd. (Thorold, Ont.), has been signed by management and the International Pulp, Sulphite and Papermill Workers. The contract expires April 30, '61.

LEGAL

Stop-Order Asked: A group of Hagerstown, Md., residents has petitioned a Maryland circuit court to stop Central Chemical Co. from operating "whatever of its processes are causing the destruction of lawns and foliage in the area." The plant site is some 350 yds. from the residential area where the alleged blight started.

Although the company will not comment, chances are it will continue as is unless ordered to stop by the court. CHEMICAL WEEK learned that another group of residents not long ago tried to blame the plant for the deaths of robins in the area. It was later discovered the birds had been killed by a virus.

•

Expected FDA Ruling: Companies using chemical food additives are looking for a ruling in the next couple of weeks from the Food & Drug Administration that will prohibit the use of oil of sassafras and/or safrol in foods. After official publication in the *Federal Register* such foods, if shipped in interstate commerce, would be subject to seizure.

•

Price of Fish: American Viscose Corp, has settled for $30,000 a $154,-000 fine levied against it by the Virginia Water Control Board for allegedly killing 500,000 fish last year when it dumped waste into the Shenandoah River.

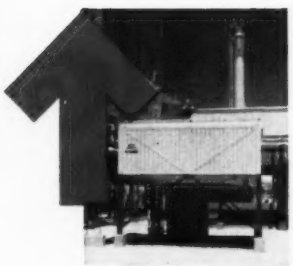
WHEN YOU REPLACE GO MODERN —AND SAVE MONEY, TOO

Aimco offers exclusive design— unequalled for heat transfer efficiency

If your present air-cooled equipment is structurally and mechanically sound, modernization through replacement of existing cooling tubes with Aimco fintubing may easily pay for itself through greatly increased efficiency in heat dissipation.

Aimco fintube is fabricated on special patented machinery that gives it a uniform, tapered spiral design, forming a mechanical bond to the seamless tube – regardless of the materials used. Wrapped continuously on the tube, fins form a tight and permanent seal which prevents exposure of the base tube to the atmosphere, protecting it against corrosion as well as rust in steel tube application. Once formed on the tube, fins will not uncoil or work loose through changes of temperature, pressure, or even vibration. *All performance tests conducted prove that exclusive Aimco design gives highest heat transfer efficiency – therefore most economical heat dissipation!*

Whatever your particular requirements, you get the very best when you specify Aimco, quality leader in fintubing.



For the complete package on a new or replacement air-cooled heat exchanger, specify reliable Transaire, ideal for many varied processing operations. Full information on request.

Yuba also manufactures a complete line of shell and tube heat exchangers, and will recommend either type, whichever is required or best suited for the job.

YUBA

specialists in heat transfer equipment

YUBA-AIMCO DIVISION

801 West 21st Street, Tulsa, Oklahoma

YUBA CONSOLIDATED INDUSTRIES, INC.

Sales Offices in Atlanta • Buffalo • Chicago • Cleveland • Houston • Los Angeles • New York • Philadelphia • Pittsburgh • San Francisco • Seattle

ADMINISTRATION

KEY CHANGES

J. Harris Ward and **Paul A. Gorman** to board of directors, Union Carbide Corp. (New York).

C. L. Barksdale and **T. W. Bruner** to board of directors, Hagan Chemicals & Controls, Inc. (Pittsburgh).

Adolf W. Jann and **Irving Riker** to board of directors, Hoffmann-La Roche, Inc. (Nutley, N.J.).

George H. Weyerhaeuser and **Howard W. Morgan** to board of directors, Weyerhaeuser Co. (Tacoma, Wash.).

Herschel H. Cudd to president, AviSun Corp., jointly owned affiliate of American Viscose and Sun Oil Co. (Philadelphia).

Albert M. Garbade to president, United States Manganese Corp. (New York).

Herbert W. Rogers to chairman of the board, **Harry D. Feltenstein, Jr.,** to president and chief executive officer, **Harvey Diehl** and **Robert M. Stanly** to board of directors, Lithium Corp. of America (Minneapolis).

James H. Crow, Jr., to vice-president, Chemstrand Corp. (Decatur, Ala.).

Seymour S. Jackson to vice-president, administration, Kennecott Copper Corp. (New York).

Reese H. Tucker to vice-president, Cities Service Co. (New York).

Presson S. Shane to vice-president, Atlantic Research Corp. (Alexandria, Va.).

Warren C. Lothrop and **Howard O. McMahon** to senior vice-presidents, Arthur D. Little, Inc. (Cambridge, Mass.).

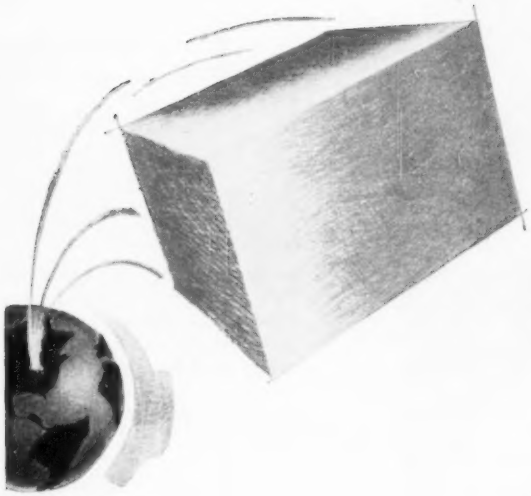
Clifford D. Siverd to general manager, Agricultural Division, American Cyanamid Co. (New York).

Robert T. Kimberlin to secretary and **R. O. Jones** to director, long-range planning, Crown Zellerbach Corp. (San Francisco).

RETIRED

Russell L. Curtis, vice-president, The Dow Chemical Co. (Midland, Mich.).

There's no *Pace** like foam



. . . or how to keep up with a fast-moving industry

NEW DEVELOPMENTS in the mushrooming field of urethane foams come fast and furious. It seems like every time you light your bunsen burner, someone has found another use for these versatile materials, or another way to improve them.

How, then, can anyone keep up with all these new developments? The answer is that nobody can. No single company can either, for that matter.

But that doesn't stop us at Wyandotte from trying. Our modern urethane laboratories are literally frothing with activity. Developing new molecules. Rearranging old ones. Testing foams.

Triols bring changes

Take polyether triols, for example. These materials have brought extensive changes in the technology of one-shot flexible foams. Our own PLURACOL® Triols, a series of polyoxypropylene derivatives of trimethylolpropane, have increased load-bearing properties, improved compression set, and made possible high impact-absorbing characteristics.

Rigid foams prepared using these triols exhibit good dimensional stability, high closed-cell content, good heat resistance, low water absorption, and high compressive strength at low densities.

A useful catalyst

Or take urethane catalysts. We have a continuing research program under way on the effects of catalysts in urethane reactions.

Our own QUADROL®, for example, has proven to be an excellent catalyst and cross-linking agent. It is highly reactive . . . its four hydroxyl groups provide multiple cross-linking sites. Its two tertiary nitrogen atoms provide catalysis for the reaction. QUADROL is infinitely soluble in water, exceptionally stable to heat, and has a relatively low order of toxicity.

* * * * *

Would you like to keep abreast of these and other developments at Wyandotte? If so, drop us a line, giving as many details as possible about your requirements. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*

In addition to those products mentioned above, Wyandotte's urethane-foam raw materials include PLURACOL Diols, used for prepolymer-type flexible foams and to impart strength properties to one-shot flexible foams; and TETRONIC® Polyols for improved resilience and moldability.

Wyandotte CHEMICALS

MICHIGAN ALKALI DIVISION

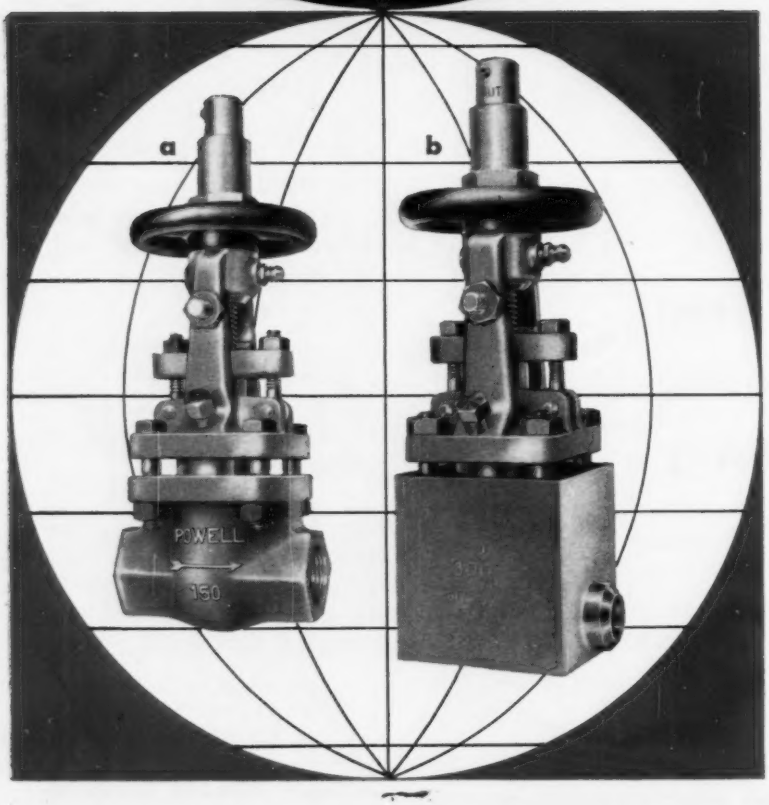
PACING PROGRESS WITH CREATIVE CHEMISTRY®

Performance makes the world of difference

In step with the times, Powell designs and makes valves to successfully handle the fluids that are necessary in the operation of atomic power plants, submarines and merchant ships.

These valves are absolutely leak tight and can be depended upon to render long unfailing service—the result of Powell's constant quality control of materials and manufacturing methods, precision machining, cleaning and degreasing of all parts, and thorough testing.

For complete information consult your nearest Powell valve distributor or contact us.



a
Stainless Steel Screwed End Globe Valve for 150 pounds W.P. Because of the specially designed stuffing box, and the special gasket at the body-bonnet joint, these valves are absolutely leak tight. Provided with an extension stem coupling for remote operation.

b
Stainless Steel Block Type Globe Valve for 300 pounds W.P. Butt welding ends. Inner Bell-o-Seal construction protects lower section of stem against any corrosive action of the fluid being handled and makes the valve packless. Valves are fitted with an extension stem coupling so they can be remotely operated.

THE WM. POWELL COMPANY
Dependable Valves since 1846
Cincinnati 22, Ohio

Powell . . . world's largest family of valves

Washington
Newsletter

CHEMICAL WEEK
June 11, 1960

Passage of the color additives bill is virtually assured—and it will include the industry-opposed Delaney amendment, which flatly bans use of any cancer-causing agent in products. The House will vote on the bill soon and the Senate will probably accept it as is, although a Senate-passed bill did not contain the cancer clause.

Industry is not concerned about short-term effects. As far as anyone can tell now, no product will be banned. The bill permits FDA to set tolerances for colors (such as coal-tar dyes in lipstick), which would otherwise be banned as toxic. FDA has already run short-term tests on 14 lipstick colors. The tests have turned up no evidence that any of the colors are carcinogens (cancer causers). It is still possible, of course, that long-term tests will turn up adverse results. But where there is a problem, the short tests usually provide a clue.

Industry's biggest fear is that some time in the future a color will be found carcinogenous and a cranberry-type incident will ensue. Also, it feels that research on new products will be dampened because of the possibility that a new product might be ruled off the market as a result of the amendment.

The new law will mean that food, drug and cosmetic firms will have to undertake expensive testing. They have 2½ years in which to prove the safety of their products. This had to be done under the food additives law, too. (Testing and approval of food additives is not yet complete, but indications so far are that no important food additives are going to be banned. Fears on the food additives question are subsiding.)

Industry had tried—as a minimum concession—to have the bill provide for the establishment of a permanent scientific advisory committee to which it could appeal any FDA ban on a color additive. The House bill includes a gesture to meet this request: if a product is turned down, a company can request establishment of an *ad hoc* advisory committee to study it. But the FDA does not have to accept the committee's recommendations. The Senate may make an effort to strengthen this provision.

•

The final form of the minimum wage bill that will emerge from Congress can now be seen. The House Labor Committee is expected to report shortly on a bill that will be acceptable to the Senate, to labor, and probably even to the President.

The proposal would raise the $1 minimum to $1.15 this year, $1.20 in '61, and $1.25 in '62, and extend coverage to some 4.2 million workers, including chiefly those who work in big deparment and food store chains.

An interesting bit of Presidential politics figures in this. Sen.

Washington Newsletter

(Continued)

John Kennedy (D., Mass.) is hoping to get a Senate vote on a bill with his name on it; Sen. Lyndon Johnson (D., Tex.) has been stalling until the House bill comes to the Senate. Then the Senate will take up the House bill instead of Kennedy's.

•

U.S. investors abroad will get some tax benefit on profits earned overseas next year, if a Senate-House conference committee approves a bill to permit a lumping together of all foreign taxes for purposes of figuring the U.S. tax.

The bill, which has passed both houses, works this way: the parent U.S. firm may calculate an average of taxes it pays to a foreign government. If the average is higher than the 52% U.S. rate, the company can get a credit from Treasury. Under present law, the U.S. company must figure its domestic tax separately on each overseas plant, pay the difference if the foreign tax is lower.

This proposal originally was part of a package bill of foreign investment tax benefits introduced by Rep. Hale Boggs (D., La.). The Boggs bill, now pending before the Senate Finance Committee, has been pared down to this main provision: it would defer U.S. taxes on profits earned in underdeveloped overseas areas until they are brought back to the U.S.

•

Liquid hydrogen-fueled rockets to be developed by North American Aviation's Rocketdyne Division under a new government contract will make it possible to put 20-ton payloads in earth orbits, or send 9-10-ton loads to the moon. Development will help close the gap between U.S. and Russian rocket power.

The rockets will serve as upper stages for the big 1.5-million-lbs.-thrust Saturn engine. Some $8 million is programed for the project in the '61 budget; it will cost about $44 million over three years.

•

San Diego will finally get a saline-water demonstration plant of 1-million-gal./day capacity—but with a conventional heat source instead of a nuclear reactor (*see p. 86*).

•

Senator Kefauver's revelations of activities of Dr. Henry Welch is putting the Food & Drug administration under serious attack (*see p. 24*). There were reports circulating early in the week that FDA administrator George Larrick may soon become the victim, either resign by choice or persuasion by the Administration. Larrick says he has no intention of quitting; neither does he believe he will be fired. But the disclosures put the Administration in an unenviable position. If nothing more extreme is done, then some reorganization to tighten the line of responsibility from the Health, Education & Welfare Dept. to FDA may be established.

Start with Monsanto

ACRYLONITRILE

FOR RUBBER PRODUCTS WITH HIGH RESISTANCE TO OILS, GREASES, SOLVENTS, CHEMICALS, HEAT, ABRASION, AND WEATHERING

Acrylonitrile—polymerized, or copolymerized with butadiene and other monomers—is today the basis for nitrile rubber and other rubber compounds with highly useful commercial properties. These many types of acrylonitrile rubbers are used extensively in hoses, shock absorbers, adhesives, linings for equipment handling corrosive products and solvents, shoe soles and heels, insulation, and flexible electrical coupling.

Also a popular raw material source in plastics, adhesives, surface coatings, and textiles, acrylonitrile contributes these basic properties to many polymeric materials: solvent and chemical resistance, surface hardness, toughness, heat resistance, light stability, over-all weatherability, high tensile and structural strength, high adhesion, rapid air drying, and bacteria resistance.

This ability to impart unique performance properties to a wide range of materials is based on the highly polar nitrile group and reactive double bond present in acrylonitrile. Acrylonitrile can be polymerized to form emulsions, suspensions, solutions, or solids. It can be copolymerized with butadiene, styrene, vinyl, and other highly active monomers. It readily undergoes additional polymerization to form high molecular weight products. Its nitrile group can be converted into acid, ester, amide, or amine.

Monsanto, world's largest producer of acrylonitrile, has prepared a concise, easy-to-read brochure, which details complete application, reaction, testing and handling data on this versatile monomer. Send coupon below for your free copy. Monsanto Chemical Company, Plastics Division, Springfield 2, Massachusetts.

MONSANTO INITIATOR IN **PLASTICS**

Monsanto®

Monsanto is also a leading producer of styrene monomer, vinyl chloride monomer, and methanol.

ACRYLONITRILE APPLICATION RESEARCH SERVICE

Monsanto Chemical Company, Plastics Division
Room 743, Springfield 2, Massachusetts

Please send me new brochure on MONSANTO ACRYLONITRILE.

Name_____ **Title**_____

Company_____

Address_____

City & State_____

chemicals on the move... surfactants

Get the surfactant performance you need with the Poly-Tergent series. These nonionic surface active agents are effective dispersants, emulsifiers, wetting agents and detergents. They offer unusual solubility values and outstanding results in the presence of acids, alkalis and polyvalent metallic salts.

The Poly-Tergent surfactants have proved effective in scouring, desizing, bleaching, dyeing and printing operations in the textile industry. In pulp and paper they are used for rewetting, deinking, pitch control and felt washing. Other applications are in water-base paints, pesticide formulation, metal cleaning and petroleum demulsification.

Eight Poly-Tergent surfactants are produced in three different compositions. LCL shipments in drums can be made from distributor stocks; tank car quantities from the plant. Write for samples and technical data sheets.

Olin Mathieson

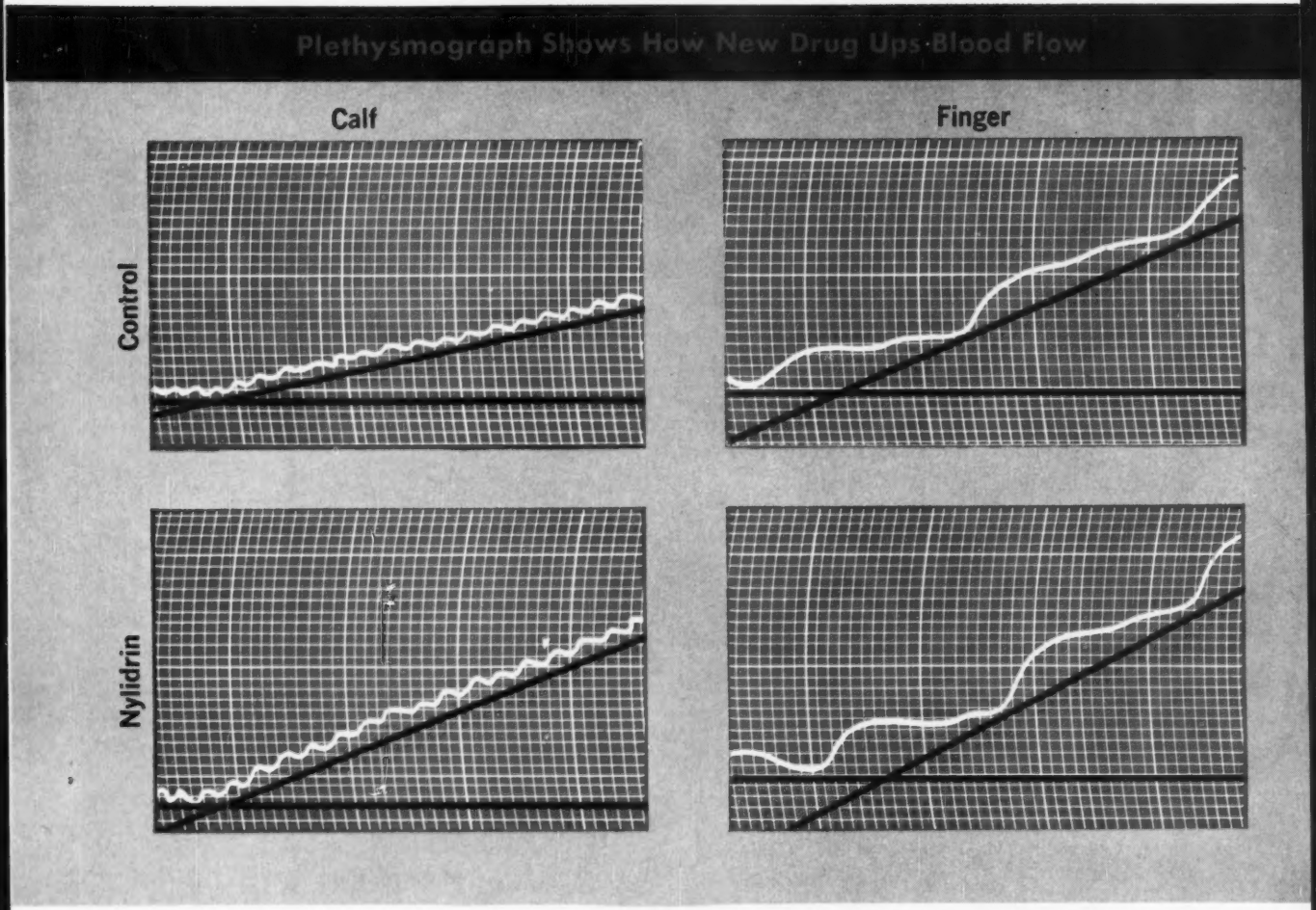
CHEMICALS DIVISION, NEW YORK 22, N.Y.

CHEMICALS

7439

Poly-Tergent® is a trademark

ETHYLENE OXIDE • ETHYLENE GLYCOLS • POLYETHYLENE GLYCOLS • PROPYLENE OXIDE • PROPYLENE GLYCOL
POLYPROPYLENE GLYCOLS • ETHANOLAMINES • GLYCOL ETHERS • SURFACTANTS • ETHYLENE DICHLORIDE



Plethysmograph measures blood flow resistance, helps evaluate new drugs to combat vascular diseases.

Cholesterol Fighters Cut Coronary Risks

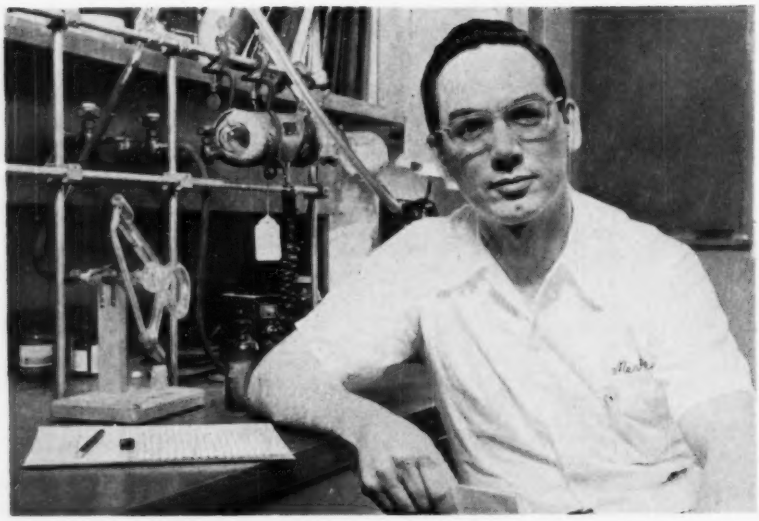
New drugs to combat circulatory ailments are emerging this week from clinical trials: nylidrin hydrochloride, designed to stimulate sluggish blood flow (see charts); and a number of products that lower blood cholesterol levels (anticholesteremics), possibly staving off diseases such as hardening of the arteries.

Behind these products lies an industry-wide, multimillion-dollar research effort by pharmaceutical companies and institutions to find out more about both the cause and cure of vascular diseases. A major stimulus for this effort is the soaring mortality rate due to coronary attacks. In New York City's suburban Westchester County, for example, the record shows that "in '49 one out of every seven cases of . . . hardening of the arteries . . . was under the age of 45, while in '59 this had increased to one out of every four . . .".

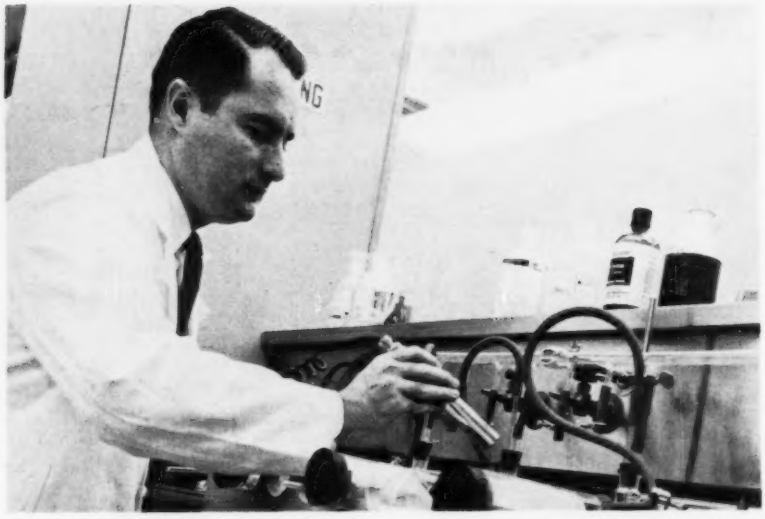
Dr. David Spain, who turned up these figures, links softer living and richer diets to the trend. And he has turned up more evidence that examination of the concentration of cholesterol in the blood can help investigators spot potential coronary victims. One observation: that the Bantu native of South Africa has both low blood-cholesterol and little atherosclerosis.

It is control of the cholesterol level, in fact, that is the target of the new drugs. One approach to combating vascular trouble is to relieve the symptoms. That's the principle behind nylidrin, an adrenalin-like compound that dilates blood vessels (perhaps constricted by cholesterol) and increases blood flow to deprived areas.

Chemically, nylidrin — which U.S. Vitamin and Pharmaceutical Corp. (New York) tradenames Arlidin—is 1- (*p*- hydroxyphenyl)- 2- (methyl-3- phenyl-propylamino) propanol hydrochloride. In recent tests it has been shown to increase blood flow in the extremities (e.g., fingers) and the brain, counteracting a common



Merrell's Palopoli synthesized MER/29, new anticholesteremic.



Biochemist MacKenzie used radioisotopes to track drug's action.

cause of pain associated with heart disease. Clinicians at the University of Southern California School of Medicine and the Heart Research Foundation (Los Angeles) recently pointed out that nylidrin acts in a way superior to drugs such as tolazoline and nicotinic acid, which exert their beneficial effects primarily on the skin blood vessels.

Much of the current research is directed at staving off — rather than relieving — vascular trouble, primarily by establishing why cholesterol collects on artery walls, interfering with circulation, and what high blood cholesterol levels have to do with this process.

Cholesterol Control: The subject has had appreciable research by makers of edible fats (*CW, March 23, '57, p. 58*), because restricting intake of fat or replacing it partly with unsaturated fatty acids is believed to control cholesterol levels in the body. Some new pharmaceuticals are really dietary aids, others are drugs that inhibit cholesterol by other means. Early in the cholesterol research, substitution of fatty acids for saturated fats in the diet was done mainly by using linoleic acid and the like. This approach has been refined in new products such as Lenic HP capsules made by Crookes-Barnes Laboratories, Inc. (Wayne, N.J.). These contain unsaturated fatty acid glycerides; arachidonic, pentenoic, hexenoic, linoleic and oleic acids; saturated fatty acid glycerides and mixed tocopherols. Arachidonic acid is thought to esterify the body's cholesterol.

Other ways to force down cholesterol levels include reducing its absorption from the intestinal tract by means of compounds such as sitosterol (although the body eventually steps up cholesterol production in order to compensate); by using estrogenic hormones (possible severe side effects); and by intake of thyroid hormones that work by speeding up metabolism (said to be poorly tolerated by cardiac patients).

Thyroid derivatives are being studied for this use by Warner-Chilcott Laboratories Division of the Warner-Lambert Pharmaceutical Co. (Morris Plains, N.J.). And Baxter Laboratories (Chicago) has a new thyroid product undergoing clinical trials.

Still another answer to cholesterol-caused problems is to inhibit formation in the body. Early trials used 7-dehydrocholesterol or dehydroisoandrosterone. The first commercial product for this purpose is newly launched MER/29, developed by Wm. S. Merrell Co. (Cincinnati), a division of Vick Chemical.

Synthesized by Merrell's Frank Palopoli, the compound is 1-[*p*-(β-diethylaminoethoxy) phenyl]-1-(*p*-tolyl)-2-(*p*-chlorophenyl) ethanol. It has safely reduced cholesterol levels in most, although not all, patients clinically observed. Among the latter were patients who had recovered from acute attacks of coronary disease.

On unrestricted diets, 45 patients in one test reduced cholesterol levels 75-25 mg. %. All previously had levels above 250 mg. %, higher than normal (150 mg. %-250 mg. %). The term mg. %, now standard, refers to mg. cholesterol per 100-mg. serum.

While recognizing that "it has not been scientifically established that sustained reduction of a patient's cholesterol level will prevent a heart attack or delay its onset," Merrell's director of professional relations, Dr. John Chewning, points out, ". . . cholesterol is incriminated to such an extent that many authorities feel its reduction is an exceedingly prudent, and probably protective, measure for

all persons threatened by atherosclerosis or its consequences. And in the present state of knowledge, it [cholesterol control] is one of the few controllable factors that can reasonably be expected to afford prophylactic and therapeutic benefits to such persons."

Late Worker: Unlike many other compounds, MER/29 (brand of triparanol) works by inhibiting cholesterol synthesis in the body at a late stage. Cholesterol is built upon the steroid nucleus, a four-ring structure of carbon atoms that is also the framework for sex and adrenal cortex hormones and vitamin D.

The compound is synthesized in the body — mainly in the liver — as well as being ingested in dietary fats and is apparently important in physiological processes such as adrenal steroid production. MER/29 inhibits the conversion of intermediates — particularly an immediate precursor, desmosterol — into cholesterol. It neither changes thyroid activity nor accelerates metabolism.

How Far to Go: There are still some important unanswered questions about anticholesteremics: Would draining too much cholesterol precipitate a dangerous condition? What happens if enough cholesterol isn't available in the system for producing necessary steroids?

The answer seems to lie in close control of the use of any anticholesteremic in the patient. In the case of MER/29, much is known about its clinical behavior. (Several thousand patients are now trying the drug.) One thing still not known, however, is whether it will remove atherosclerotic plaques already present. A definitive answer may require years of study, Merrell says.

Meanwhile various new ways to curb cholesterol formation are being tried. Injections of desoynucleic acid produced a permanent anticholesteremic affect in rabbits, according to research by Dr. J. Philip Savitsky, at Montefiore Hospital, Bronx, N.Y.

Among newer hormones that have been investigated is 16- α- chloro estrone 3- methyl ether. Italian physician G. Annoni, reporting in the Feb. 13, '60 "Journal of the American Medical Assn.," observed that while the compound decreased cholesterol it also displayed estrogenic side effects.

A new commercial anticholesteremic compound is Nicalex, produced by Walker Laboratories, Inc. (Mount Vernon, N.Y.). Each tablet contains 625 mg. of aluminum nicotinate—which Walker says is equivalent in biological activity to 500 mg. of nicotinic acid. It reportedly offers the advantages of nicotinic acid without the flushing and gastrointestinal irritation produced by the latter.

For use without dietary restrictions, the compound is said to be indicated where hypercholesteremia may be associated with diabetes, nephrosis, obstructive jaundice, hypothyroidism and hypertension.

All these materials are produced on the assumption that high cholesterol levels contribute to blood-vessel diseases — still a moot point.

But there is a growing amount of evidence of the sterol's guilt. Pathologist Spain's work is some of the strongest proof. In tests on thousands of patients at Beth-El Hospital in Brooklyn, N.Y., he observed that persons having cholesterol levels over 300 mg.% were three times more vulnerable to coronary attack than persons having normal levels. The test was said to be particularly reliable in patients under 50 years of age.

On the other hand, Dr. Teodoro Cesarman of the Instituto Nacional de Cardiología (Mexico City) recently told the 35th Pan American Medical Congress that a study of 1,000 cases of proved myocardial infarction showed no significant rise in serum cholesterol levels in most patients. At the Washington University School of Medicine (St. Louis) high milk diets have been linked with myocardial infarction.

Weight of evidence seems to be about to settle the controversial issue, however. British researchers at St. George Hospital and Medical School in London conducted a long-range investigation of polysaturated fats (e.g., safflower, soya, corn, and cottonseed oils) substituted for saturated fats in the diet, found that blood cholesterol was reduced, as was the incidence of coronary thrombosis among patients making the test.

While new drugs alleviate cholesterol formation, they can prove expensive, particularly if it's necessary to take them over a long period of time. That's likely to be true until a

Borax is an essential part of glass and ceramics which must resist the effects of alternating heat and cold. Typical are Pyrex brand dishes which tolerate the thermal range from oven heat to table to refrigerator. (Courtesy Corning Glass Works)

Skilled Technical Service
Exceptional Quality
Prompt Shipment

These are the characteristics which have won Stauffer a gratifying reputation among users of Borax.

BORAX

Stauffer's "West End" Borax is available in numerous forms—decahydrate, pentahydrate, anhydrous, glass and the popular Hand Soap Borax in regular, coarse granular and extra fine grades—all of highest purity.

We are a leading producer, drawing from the inexhaustible resources of Searles Lake. Huge refining facilities and storage capacity permit prompt shipments from Westend, California, and stock points to all parts of the country.

Send for a new 28-page illustrated brochure, "Borax and Other Boron Products"... and look to us for prompt answers to requests for technical information.

Salt Cake:
99.75 to 99.80% purity with not over 2½ ppm heavy metal content.

Soda Ash:
Numerous analyses and particle sizes.

Boric Acid:
Crystal, Granular, Powdered and Impalpable in Technical, U.S.P., and Radio grades from stock points throughout the country.

Stauffer CHEMICAL SINCE 1885

STAUFFER CHEMICAL COMPANY

380 Madison Avenue, New York 17, New York

Chicago 1, Prudential Plaza / San Francisco 8, 636 California Street
Los Angeles 17, 824 Wilshire Boulevard / Houston 15, P.O. Box 9716
North Portland, Ore., Suttle Road / Akron 8, 326 South Main Street

West End Chemical Division, Oakland, California

Borax in all forms, Salt Cake, Soda Ash and Boric Acid

75 YEARS OF SERVICE TO INDUSTRY AND AGRICULTURE 1885 1960

WELCOME MATS TO GREET YOUR GUESTS are made of synthetic rubber produced by emulsion polymerization. The process is easier with Witco's Emcol K-8300. This emulsifier, which is also useful in the manufacture of adhesives from synthetic and natural rubber latex, offers excellent tolerance to electrolytes which coagulate conventional latices. It imparts to finished latices superior freeze-thaw stability and allows the preparation of low viscosity latices with high solids content. Emcol K-8300 stabilizes latices prepared with other emulsifiers against coagulation caused by mechanical agitation.

Other Witco quality chemicals for industry include:

ORGANIC CHEMICALS DIVISION

Metallic Stearates • Resins for Urethane Foams • Paint Driers • Emcol Emulsifiers for Agriculture, Industry, Food, Cosmetics • Phthalic Anhydride • Vinyl Stabilizers

RUBBER CHEMICALS DIVISION

Carbon Blacks • Rubber Plasticizers, Accelerators, Anti-Sunchecking Wax

PIONEER PRODUCTS DIVISION

Asphaltic Compounds for Storage Tank Insulation and Vapor-Sealing • Witcolite Insulation for Underground Piping

ULTRA CHEMICAL WORKS

Sodium and other Salts of Xylene and Toluene Sulfonic Acids (Hydrotropes) • Foam Builders and Stabilizers • Alkyl Aryl Sulfonates

SODEN CHEMICALS DIVISION OF WITCO CHEMICAL CO., CANADA, LTD.

Carries the complete line of Witco Chemicals in Canada

WITCO CHEMICAL COMPANY, Inc.
122 East 42nd Street, Dept. CW-6 New York 17, N. Y.

Please send me information on the following products:

_____

_____

I am interested in the following applications:

_____

_____

_____

Name_____

Company_____

Address_____

City_____ Zone_____ State_____

Sales Offices in Chicago • Quincy-Boston • Akron • Atlanta • Houston • Los Angeles • San Francisco • Toronto and Montreal, Canada (Soden Chemicals Division) • London and Manchester, England • Glasgow, Scotland • Rotterdam, Holland

RESEARCH

potentially large market is realized and research costs can be amortized. But one thing is sure, as an ounce of either prevention or cure, new chemical compounds are assured of a key role in battling vascular diseases.

Polymer Precursor

Pimelic acid, newly available in development quantities from American Cyanamid's petrochemicals department (New York), may be the key to new polyester and polyamide resins and fibers. A white, crystalline solid, the compound reacts in a fashion typical of dibasic acids (e.g., to form amides easily dehydrated to nitriles), also forms pimelic esters potentially useful as plasticizers.

Compared with other dibasic acids having odd numbers of carbon atoms, pimelic acid (seven carbons) features a lower melting point and higher water solubility, opening the door to potentially novel products. However, Cyanamid says that because of the limited quantity available to date, pimelic hasn't been checked out intensively for plastic and fiber applications.

PRODUCTS

Pressure Easer: Geigy Pharmaceuticals (Ardsley, N.Y.) is offering a new oral antihypertensive-saluretic drug for treatment of arterial hypertension, and for relief of edema involving salt and water retention. Called Hygroton (brand of chlorthalidone), the compound is 3-hydroxy-3-(4-chloro-3-sulfamylphenyl) phthalimidine. Price to druggists: $6.60/-bottle of 100 tablets.

•

Acid Entries: Development quantities of γ-phenoxybutyric acid and derivatives γ-2,4 dichlorophenoxybutyric acid and γ,γ,-dithiodibutyric acid are now available from Aceto Chemical Co., Inc. (Flushing, N.Y.). They're suggested for use as weed killers and intermediates.

•

Gold Find: Powder and sheet forms of 99.999%-pure gold are now offered by High Purity Metals, Inc. (340 Hudson St., Hackensack, N.J.), for use in assembling semiconductors. Feature: good wetting to silicon at 700 C.

Tough Lube: General Electric's (Schenectady, N.Y.) research lab has uncovered a solid lubricant that reportedly can handle as much as 20 times the load of other solid lubes. It's made by addition of various inorganic sulfides (e.g., antimony, platinum, mercury, silver, titanium and lead) to molybdenum disulfide or to tungsten disulfide. Probable use: high-temperature-operating miniaturized devices.

•

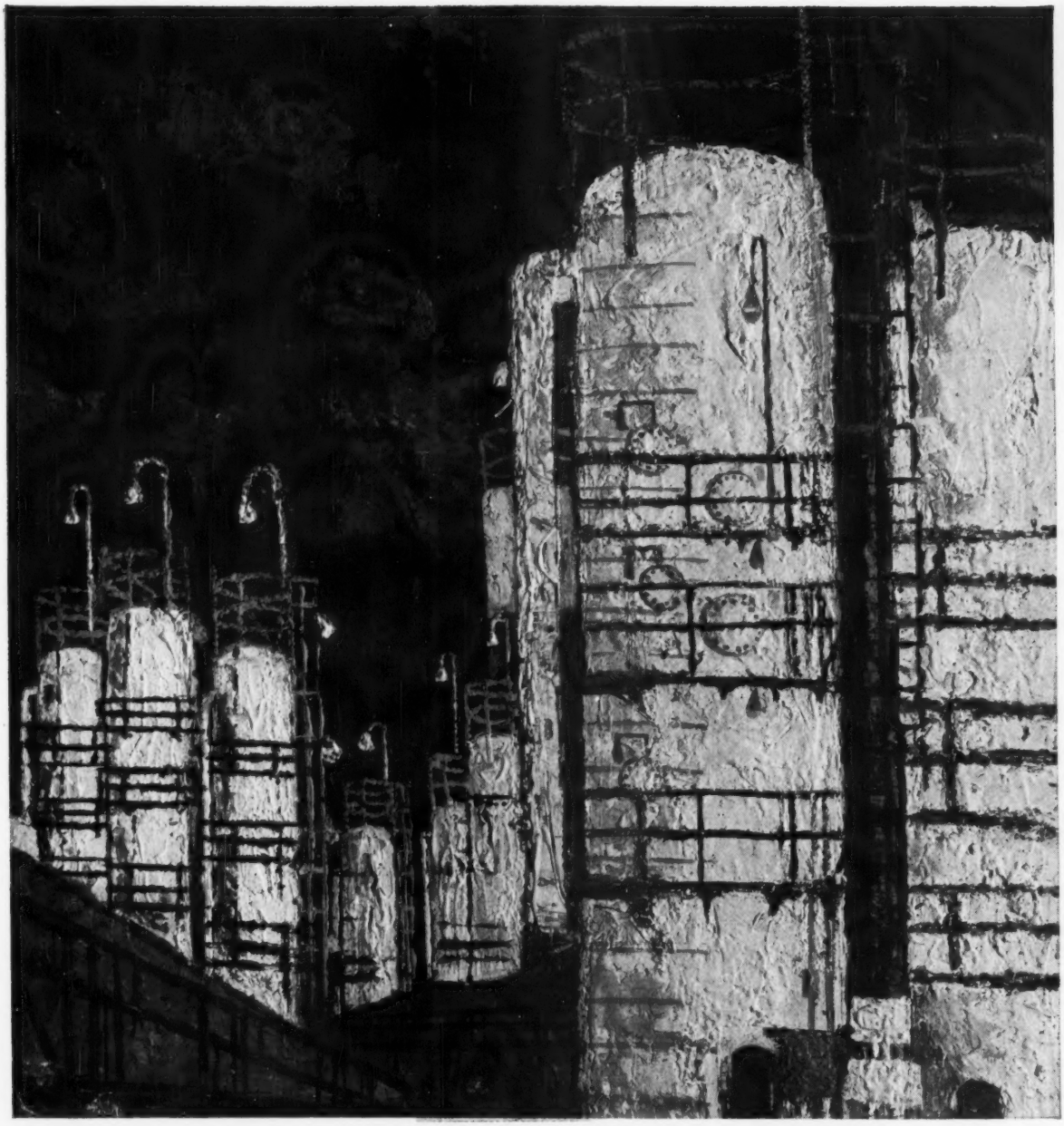
Plasticizer: An epoxidized soy bean oil plasticizer called Drapex 6.8 is claimed to triple or quadruple the outdoor life of vinyls. For sample or technical bulletin, write Argus Chemical Corp. (633 Court St., Brooklyn 31, N.Y.).

•

Alkaloids: Lupin alkaloids and related compounds, including 3-hydroxy sparteine, are offered by Mann Research Laboratories, Inc. (New York). They're for biochemical research.

Patent Pioneer

John Flora (*above*), a group leader with Atomics International (Canoga Park, Calif.), checks diagram of a laboratory reactor that recently won the first U.S. patent (2,937,127) to be granted to a private company for a complete nuclear reactor system. Assigned by Flora to AI's parent, North American Aviation, Inc., the patent covers a solution-type reactor that can be used for research as well as for isotope production.



More drying per dollar in nine towers showed Columbia Gulf Transmission why it pays to

mix imagination with Alcoa Aluminas

Nearly ½-million lbs of Alcoa® Activated Alumina is giving Columbia Gulf Transmission Co. maximum drying capacity per dollar in one of the world's largest natural gas drying operations. Used in nine towers at the company's Rayne, Louisiana, compressor station, the activated alumina dries 690 MMSCF of natural gas per day. Average water content of gas entering the towers is 5-6 lbs water/MMSCF. Water content of the effluent gas is below ½ lb water/MMSCF. Each tower is on stream for 24 hours with a reactivation time of 6 hours. Columbia Gulf Transmission has found that no other desiccant can furnish such efficient drying at such low cost.

When effective, economical drying is your aim, it pays to mix imagination with Alcoa Activated Aluminas—the oldest commercial desiccant available and still the most efficient. For detailed data, send for a free copy of the Alcoa White Data Sheets and a comprehensive Gas and Liquid Dehydration Questionnaire. Aluminum Company of America, Chemicals Division, 707-F Alcoa Building, Pittsburgh 19, Pa.

ALCOA CHEMICALS
ALUMINUM COMPANY OF AMERICA

For finer products . . . let Alcoa add new dimension to your creative thinking!

RESEARCH

EXPANSION

• The Dyestuff and Chemical Division of General Aniline & Film Corp. (New York) has expanded its paper applications research activities at the firm's Central Research Laboratories in Easton, Pa.

• J. O. Ross Engineering Division, Midland-Ross Corp., has increased its New Brunswick, N.J., facilities for research on high-speed drying of coated web materials.

• Recently formed, The American Scientific Glassblowers Society, headquartered in New York, will hold its first annual symposium and exhibit at the Penn-Sheraton Hotel (Pittsburgh) June 16-18.

• The Mississippi legislature has authorized issuance of $1.5 million in bonds to finance the establishment by the University of Mississippi of a research center that will include facilities for nuclear research.

• Esso Research and Engineering Co. (Linden, N.J.) has formed a new basic research unit. The firm's president, Eger Murphree, says 25% of the total company work is now classified as basic or fundamental (including the new unit).

APPARATUS

Monochromator Pair: Two new monochromators are now available. McPherson Instrument Corp. (Acton, Mass.) is offering a 50-cm. vacuum ultraviolet scanning monochromator (Model 235) that operates at pressures below 10^{-5} mm. Hg. Accuracy is ±1 Angstrom unit. Engis Equipment Co.'s Scientific Instruments Division (431 South Dearborn St., Chicago 5) has a new monochromator (No. D284/285) that covers ultraviolet, visible and infrared regions by use of interchangeable prism systems. Two of the instruments can be mounted together to double the dispersion, increase light-gathering power and reduce stray radiation.

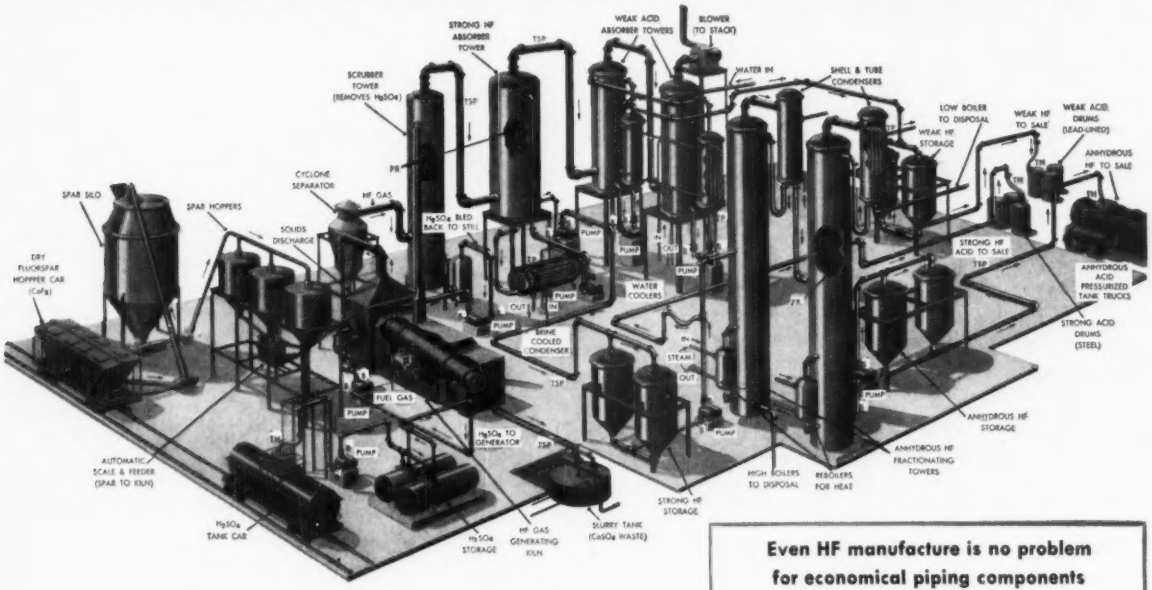
•

Lattice Models: Arthur S. LaPine & Co. (Chicago) has a new kit for making models of crystal lattices.

•

Cheaper Platinum: Fisher Scientific Co. (Pittsburgh) is the distributor of a new line of platinum-clad stainless steel laboratory ware that can handle the same jobs as can solid platinum

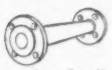
NOW AT LAST, for all your corrosive piping problems, the overall economy of long-life, corrosion-proof FLUOROFLEX-T (TEFLON)!



Even HF manufacture is no problem for economical piping components of Fluoroflex-T

Check these Fluoroflex-T piping components for economy, installation ease, long life!

TSP FLUOROFLEX-TS—Lined Steel Pipe

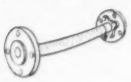


Prefabricated to length with flanges—ready to assemble. Minimizes assembly time, shortens checkout time. Complete family of fittings available.

B FLUOROFLEX-T—Bellows-Flex Joints

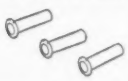
Molded rather than machined, for unparalleled flex life. Damp out equipment vibration, adjust to longitudinal and temperature movements, add years to life of equipment and piping.

TH FLUOROFLEX-T—Transfer Hose



Completely corrosion-resistant, long flex life. Cover of rubber or of stainless steel braid.

TP FLUOROFLEX-T—Condenser Tube Protectors



Eliminate erosion and corrosion by high-velocity acid on entry side of condenser tubes.

PR FLUOROFLEX-T—Raschig Packing Rings

Economical, durable, corrosion and erosion resistant, with only ¼ the weight of monel rings! Simplify tower design, costs, maintenance.

FLUOROFLEX-T—Dip Pipes, Spargers, Thermowells

Corrosion-resistant nozzle openings, steam nozzles, instrument wells in process equipment.

OVERALL ECONOMY is the key word in Fluoroflex®-T piping installations: ease of installation, decreased maintenance, long equipment life, and elimination of process headaches and downtime.

Now, as was done in the HF diagram above, it is possible for you to pipe your entire corrosive process from start to finish in corrosion-impervious, money-saving Fluoroflex-T! One plant, in fact, equipped with Fluoroflex-T reported savings of $60,000 per month in costs of maintenance, downtime, and product loss!

RECENT PRICE REDUCTIONS in many of the most popular sizes of Fluoroflex-TS lined steel pipe have been made possible by advanced technology, production improvements, and increased sales volume. These substantial price reductions made Fluoroflex-TS lined steel pipe more competitive than ever, on an installed-cost basis, with other corrosion-resistant piping materials!

Fluoroflex-T, the proprietary Teflon® product manufactured and fabricated solely by Resistoflex, is completely resistant to *any* chemical (except high-temperature fluorine and the molten alkali metals) up to 500°F.! Combining optimum flexibility, non-porosity, and strength, it is now available for process use in a complete family of Resistoflex piping components (see panels), in a complete range of sizes and hook-ups to fit any flow, process, or process path.

Resistoflex's trained engineers may have the answer to your equipment problems, to save you money, time, and headaches! Write for Bulletin today!

®Fluoroflex is a Resistoflex trademark, reg. U. S. Pat. Off.
®Teflon is DuPont's trademark for TFE fluorocarbon resins.

RESISTOFLEX
CORPORATION

Complete systems for corrosive service

Plants **in Roseland, N. J. • Anaheim, Calif. • Dallas, Tex. •** ***Sales Offices*** **in major cities**

RESEARCH

ware, yet is relatively inexpensive (e.g., $48 for a crucible). Other advantages: the new vessels are 400% stronger than all-platinum types.

•

Low-Pressure Reader: A simplified manometer for use in the pressure range below 10 mm. Hg. has been introduced by Earl Greiner Co. (20-26 North Moore St., New York 13). It's called the Cartesian Manometer, offers direct readings of absolute or differential pressures with graduations of 0.1 mm. and accuracy of 1% of full scale.

•

Moisture Meter: Advanced Instrument Corp. (Richmond, Calif.) has a new hygrometer, called the Xerometer, that can be used to give precise moisture readings of gases, liquids or solids. It covers the full range of moisture content and operates dependably at high or low temperatures.

•

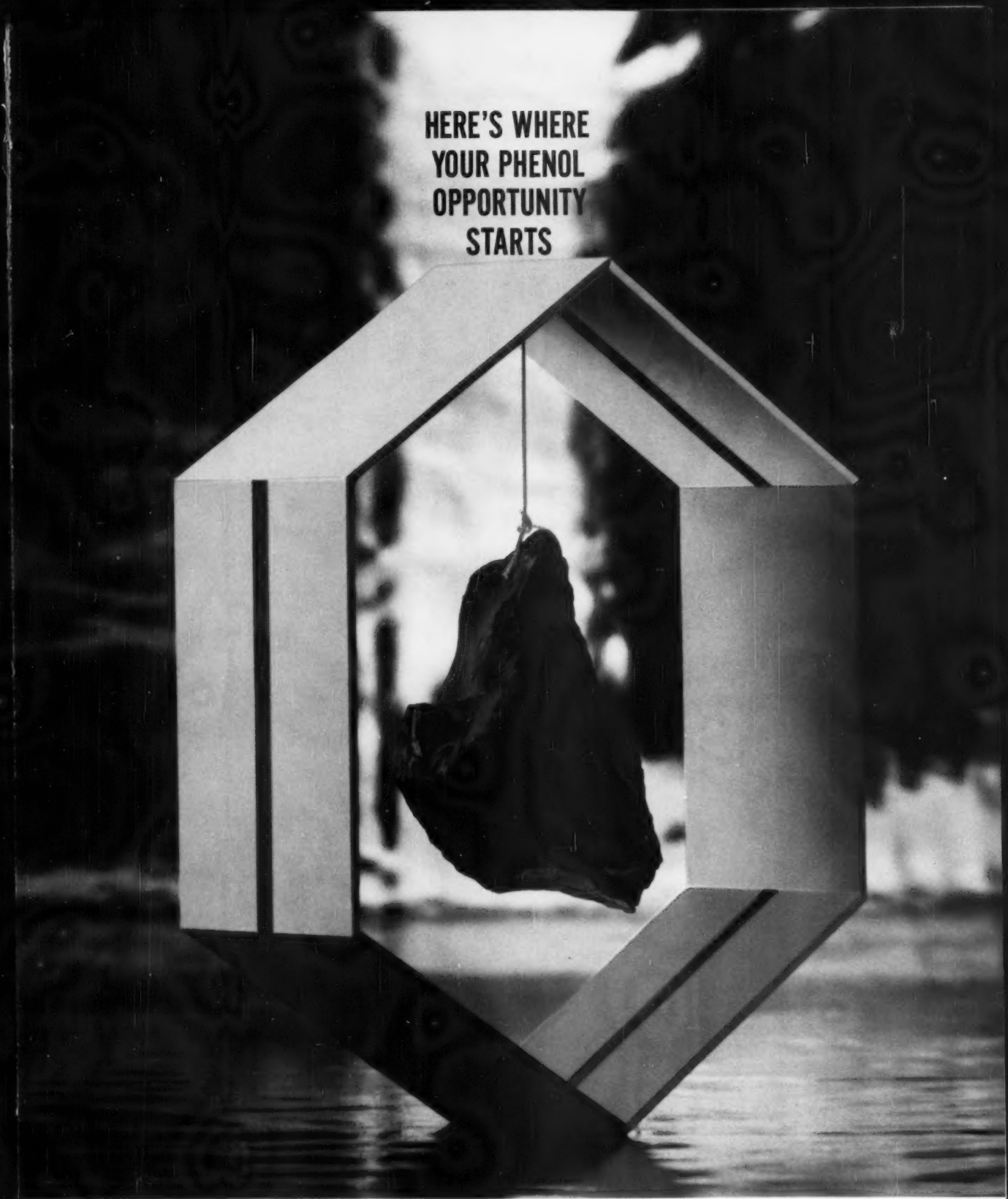
Amateur Glass-Blowing: A glass-blowing kit for scientists and laboratory personnel is available from Bethlehem Apparatus Co. (Hellertown, Pa.). The kit is priced at $246 complete, contains all accessories, plus a manual for the use of those with limited glass-working experience.

LITERATURE

• An expanded edition of "Standards Publication for Adsorption Equipment"—concerning removal of moisture from air, other gases, and organic liquids—is now available from National Electrical Manufacturers Assn. (155 East 44th St., New York 17). Price: 40¢.

• "Microscopic-Analytical Methods in Food and Drug Control," Food and Drug Technical Bulletin No. 1, covers the latest methods of identifying contaminants in food and drugs, is designed to help analysts trace adulterants to their sources. It may be obtained from the Superintendent of Documents, Government Printing Office (Washington 25, D.C.). Price: $2.

• Nearly 700 routinely available radioactive and stable isotopically labeled compounds useful in chemical and biological research are listed in newly issued, 32-page Volk Catalog 460, available free from Volk Radio-Chemical Co. (5412 North Clark St., Chicago 40).



This imaginative rendering of the benzene ring symbolizes Plastics and Coal Chemicals Division's starting point in the manufacture of its synthetic phenol. Your imagination can lead you to a profitable use of this versatile material — already widely utilized in the manufacture of dyestuffs, chemicals, medicinal products, phenolic resins — and the refining of lubrication oils. Plastics and Coal Chemicals Division supplies every grade of phenol — synthetic or natural. Thus we can unreservedly direct you to the most economical grade for your operation.

PLASTICS AND COAL CHEMICALS DIVISION
40 Rector Street, New York 6, N. Y.

Allied Chemical

TAKE A GOOD LOOK AT THESE PAGES. On them, you will find a description of the coal-tar chemicals offered by Plastics and Coal Chemicals Division. Some, like phthalic anhydride and phenol, have long been valuable basic raw materials in the chemical industry. Others, like anthracene and phthalonitrile, are commercially new. All have this in common: their potentialities for development into new and valuable products are far from being fully realized. As one of the world's larg-

PHTHALIC ANHYDRIDE

Unexcelled properties, high purity, and low cost have opened up large markets for phthalic anhydride in polyester resins, alkyd resins, plasticizers, pharmaceuticals, and fine chemical syntheses as well as in the dye industry. New and commercially valuable applications are being constantly discovered. Domestic production capacity has risen to one-half billion pounds annually.

As the world's largest producer, Allied Chemical, through its Plastics and Coal Chemicals Division, is particularly qualified to serve your phthalic anhydride needs. Allied Chemical pioneered in the production of quality phthalic by the vapor phase oxidation of naphthalene. Manufacturing experience acquired since 1919, combined with continued research on product improvement and development, enable us to supply phthalic of unsurpassed purity. In addition, we can offer invaluable applications assistance and materials handling advice.

Care of handling and fast, dependable delivery by a basic producer is assured from strategically located plants and warehouses. Plastics and Coal Chemicals Division phthalic is available in both liquid and flake forms, whichever best suits your convenience.

Boat hulls — or any other reinforced polyester product — perform better when the resin is made with phthalic anhydride. Consider these specific advantages of phthalic over other resin intermediates: fast cure; good resistance to crazing and cracking; toughness; clarity with a minimum of color; low shrinkage during cure; good weathering; low peak exotherm.

est producers of coal-tar chemicals, Plastics and Coal Chemicals Division occupies a basic position that assures reliable supply of products of unsurpassed purity, uniformity and quality. We hope that these pages arouse your interest in the present uses and potentialities of coal-tar chemicals. Continuing research is constantly working to help you make wider and more profitable use of the products described here. PLASTICS AND COAL CHEMICALS DIVISION OF ALLIED CHEMICAL CORPORATION.

PHENOL USP

(SYNTHETIC)

The development of phenolic resins, first and still most versatile of the commercial synthetic resins, stimulated the growth of the now giant plastics industry. Because they provide outstanding physical properties, such as toughness, dimensional stability and good resistance to heat, water and wear, as well as excellent electrical properties, phenolic resins are well-established and widely used. And yet recent developments, such as the revolutionary shell molding process based on phenolic resins, indicates that phenol has potentialities as a raw material that are far from being fully realized.

Phenol is a valuable basic raw material for the manufacture of a large number of intermediates for a host of different chemical products. These include nylon and epoxy resins, medicinals, dyes, photographic developers, plasticizers, wood preservatives, weed-killers, insecticides, anti-oxidants.

Whatever your process or product, you'll find that Plastics and Coal Chemicals Division synthetic phenol is tailor-made for it. Our synthetic phenol is available as a crystalline solid made to specifications even more exacting than those required for the U. S. Pharmacopeia grade, and in liquid form in phenol strengths of 92 and 85 per cent. These liquefied phenols are prepared simply by adding distilled water to U.S.P. grade crystals.

Only Plastics and Coal Chemicals Division can supply you with every grade of phenol — both synthetic and natural. Our phenol is of sufficient purity to be used for the production of nylon-6. Because we are a basic producer, your source is stable. Fast, dependable delivery by tank car or tank truck is assured. We met all our commitments for phenol in the past year, and recently backed up our confidence in the future of phenol by expanding our production at Frankford, Pennsylvania. Plastics and Coal Chemicals Division invites your inquiries as to the present uses and potentialities of phenol.

Liquid phenolic resins, which find typical applications in foundry shell molds and sand cores, afford excellent sand coating properties in both hot and cold processes, allowing fast cycles to produce cores with high tensile strength and excellent resistance to thermal shock. Another reason why phenol-formaldehyde molding materials are such valuable "work horses" for the plastics industry.

ELASTEX® PLASTICIZERS

Plastics and Coal Chemicals Division can offer you a complete line of quality plasticizers for rubber, plastics, and coatings. Our production is thoroughly integrated. We have complete control of raw materials, and our basic position assures you of a product of the highest purity and uniformity.

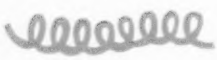
Use of one or another of the line of "Elastex" Plasticizers can upgrade any product you manufacture. "Elastex" 90-P Plasticizer (DIDP), for example, offers to the electrical wire and cable industry electrical insulation performance substantially equivalent to that of high-quality DOP, plus superior retention of elongation after severe heat-aging. It is recommended for use in vinyl compounds for high-temperature wire insulation.

"Elastex" 90-P Plasticizer is just one example. If you're puzzling over a plasticizer problem, your Plastics and Coal Chemicals Division representative, backed by an experienced technical service staff, can often guide you to a solution. Our resources are at your service in the application of our plasticizers. And you can rely on the unsurpassed quality of "Elastex" Plasticizers. Dependable, next-day delivery is assured in modern, stainless-steel tank trucks from any of our 12 strategically located tank stations.

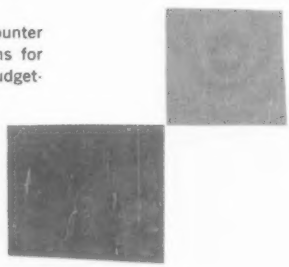
Dibutyl Phthalate*
Dimenthyl Phthalate*
"ELASTEX" DCHP Plasticizer — Dicyclohexyl Phthalate
"ELASTEX" 10-P Plasticizer* — (Diisooctyl Phthalate) (DIOP)
"ELASTEX" 28-P Plasticizer* — Di-2-Ethylhexel Phthalate (DOP)
"ELASTEX" 18-P Plasticizer* — Isooctyl Isodecyl Phthalate
"ELASTEX" 20-A Plasticizer* — Diisodecyl Adipate
"ELASTEX" 40-P Plasticizer* — Butyl Isodecyl Phthalate
"ELASTEX" 48-P Plasticizer* — Butyl Octyl Phthalate
"ELASTEX" 50-B Plasticizer* — Butyl Cyclohexyl Phthalate

"ELASTEX" 60-A Plasticizer* — Di-2-Ethylhexyl Adipate
"ELASTEX" 82-P Plasticizer* — Normal Octyl — Normal Decyl Phthalate
"ELASTEX" 90-P Plasticizer* — Diisodecyl Phthalate
"ELASTEX" 36-R Plasticizer — Medium molecular weight polymeric plasticizer
"ELASTEX" 37-R Plasticizer — High molecular weight polymeric plasticizer
Plasticizer 136* — An aryl alkyl hydrocarbon

*Available in Tank Cars or Trucks



Telephone wire cord, floor and wall coverings, dishracks, kitchen counter tops are just a few of the lengthening list of valuable applications for "ELASTEX" Plasticizers in the vinyl products so popular in the budget- and performance-conscious households of today.



NAPHTHALENE

Plastics and Coal Chemicals Division offers both crude naphthalene, in tank car and tank trucks, and refined "Polar" Naphthalene in 55-gallon fibre drums and 50-lb. fibre cases. Comes in three convenient forms: chipped, crushed and liquid. Tailored to meet all requirements for manufacturing of insecticides, tanning agents, dyestuff intermediates, pharmaceuticals, plasticizers, phthalic anhydride and other industrial chemicals.

ACETONE

Plastics and Coal Chemicals Division now offers acetone derived from the Cumene-Phenol process. It is specially purified for use in cellulose acetate and epoxy resins, and this high purity recommends it as an intermediate in chemical and drug manufacture and for use as a solvent. Its freedom from contaminants accounts for its wide use in chemical extractions and syntheses.

Fast delivery of Plastics and Coal Chemicals Division acetone by tank, car or tank truck is assured from supply depots at Boston, Buffalo, Chicago, Cleveland, Detroit, Indianapolis, Los Angeles, New York and Philadelphia. Drum stocks only at Charlotte, N. C., and St. Louis, Mo.

TAR BASES

Coal-tar bases constitute a group of homologous nitrogen-containing heterocyclic chemicals derived from coal tar. Pyridine, simplest member of the group, has long been known and used as a solvent of unique properties. Now, however, most of the pyridine produced is used for its reactive and chemical properties.

The great variety of established uses for tar bases, and recent developments such as the antihistamines, a number of which are derived from tar bases, indicate that the potentialities of tar bases and their derivatives are only beginning to be realized. In preparing many tar-base fractions and through the isolation of some individual tar bases, many possibilities have been opened up in the field of industrial and medicinal chemistry.

Plastics and Coal Chemicals Division will be glad to send you samples and technical data to help you explore the possibilities of this special class of refined coal-tar chemicals.

Refined Pyridine 2A
Pyridine 10A
Pyridine 15A
Mixed Picolines 20A
Pyridine 30A
Mixed Lutidines
Tar Bases 50A
Refined Alpha Picoline 2A
Refined Beta Gamma Picoline
Refined Quinoline
Refined 2,4 Lutidine
Special Refined Grades
Special Fractions

NIACIN USP

The finest Niacin available, manufactured by oxidation of Quinoline to meet the rigid requirements necessary for manufacturing of pharmaceuticals, animal and poultry feeds and the enrichment of flour. Blends with soy flour available for the blending of vitamin premixes.

Plastics and Coal Chemicals Division's basic position in raw materials, and its equipment of the most modern design, result in Niacin of the highest purity that meets all U.S.P. standards. We also have feed grade Niacin of 50% and 80% purity. Can be ordered from our manufacturing plant in Philadelphia and warehouses in Los Angeles and Chicago.

PHTHALONITRILE

Plastics and Coal Chemicals Division is the only domestic producer which can supply you with this high purity, aromatic, organic intermediate. It is a versatile intermediate for the production of phthalocyanine compounds, which are best known as the most color-fast blue and green pigments and dyes for the color industry.

As a phthalocyanine intermediate with "built-in" nitrogen, phthalonitrile contains no wasteful, excess atoms of oxygen, hydrogen, or carbon. Its use permits a saving in labor, simplification in processing equipment, and reduction in costs. Phthalocyanine pigments and dyes have exceptional stability to light and heat, chemical inertness, excellent tinctorial strength and color brilliancy. They find valuable uses in printing inks, plastics, rubber, linoleum, oil paints, water paints, enamels, lacquers, textile and paper printing, artists' colors and many similar applications.

Phthalonitrile is also a starting material for metal coatings and high-temperature lubricants. It can also be the progenitor of a host of new chemicals and ideas. Its formula—$C_6 H_4 (CN)_2$—with two reactive ortho-positioned nitrile groups, indicates its potential usefulness in organic synthesis.

ANTHRACENE

Now available commercially in 90-95% purity from a domestic source, Plastics and Coal Chemicals Division anthracene offers great versatility (especially in view of its economical price). Besides offering several useful routes to anthraquinone, the more recently studied reactions of anthracene open fresh synthetic possibilities to the chemical industry.

Its Diels-Alder adducts are potentially useful as intermediates for plasticizers, adhesives, tanning agents, synthetic dyestuffs, and synthetic beater sizes for paper. Products from anthracene's Friedel-Crafts reactions with olefins have value as resins and pour-point depressors for lubricating oils. It is photoconductive and also reacts photochemically.

With Plastics and Coal Chemicals Division anthracene as a starting point, you may derive a wide selection of functional groups leading to commercially valuable products.

TECHNICAL PHENOLS, CRESYLIC ACIDS, CRESOLS & XYLENOLS

Tar acids is the generic name given to a group of closely related substances derived from the middle-oil fraction of distilled coal tar. Most of the tar acids output is consumed in operations which exploit their remarkable reactive and chemical properties.

Plastics and Coal Chemicals Division has made a science of producing refined acids to exacting specifications for many requirements. Its standardization methods insure products of complete reliability. In this valuable group of manufacturing chemicals, you will find acids to the exact degree of refinement you require.

PHENOLS—SYNTHETIC & NATURAL
Technical Phenol (all grades)
Phenol-Cresol Mixes
Phenol-Cresylic Mixes

CRESYLIC ACIDS
Mixtures of close-cut fractions blended to meet particular commercial requirements
Special Engine Cleaning Grades

CRESOLS
Cresol, USP
Ortho Cresol (ranging from 50% to 98+% purity)
Meta Para Cresols
Resins Cresols
Special Cresol Fractions blended to order

XYLENOLS
Meta Xylenol —45°C., 56°C. and 61.2°C. Min. M.P.
Crude and Refined Grades
Special Fractions

ALPHA-METHYLSTYRENE

(REFINED)

A high purity, low cost unsaturated aromatic monomer. Produced by Plastics and Coal Chemicals Division's cumene-phenol operation in a 99.8% pure grade. Alpha-methylstyrene reacts more slowly than styrene and exhibits less tendency to homopolymerize. It will, however, homopolymerize in the presence of an ionic catalyst.

Alpha-methylstyrene is used in styrenated alkyd resins; high heat distortion polystyrene; polyesters; the manufacture of cumylphenol; ion exchange resins; and polymeric plasticizers. In addition, it will copolymerize with a wide variety of unsaturated chemicals and is valuable as a copolymer modifier with unsaturated compounds, including butadiene, terpenes, acrylates, methacrylates and most vinyl monomers.

CUMAR® RESIN

This versatile thermoplastic resin has been constantly improved since its introduction in 1913. Today it is available in nine separate grades manufactured under rigid chemical control from selected coal tar distillates. The wide compatibility of this neutral, stable, synthetic resin of the paracoumarone-indene type permits use with a great variety of solvents, oils, resins, and waxes. "Cumar" resin can provide successful and economical solutions to production problems in the manufacture of varnishes, floor tile, natural and synthetic rubber products, printing ink, adhesives, and waterproofing materials. Also has valuable uses in the leather, electrical, radio and paper industries. Our Technical Service Department is prepared to work with you in making resins for your specific application.

INDUSTRIAL AROMATIC SOLVENTS

Allied Chemical's basic position, plus its pioneer role in standardizing testing methods and specifications for light oil distillates, assures you a stable supply of aromatic solvents of the highest reliability. And when you order from Allied Chemical you not only get the finest in aromatic solvents — you get them quickly. If your plant is located within 50 miles of one of our ten nationwide tank wagon stations, you'll get immediate delivery by our own drivers in stainless-steel tank trucks specially equipped to handle solvents. And, from most of our stations, you can order acetones, glycols, and phthalate plasticizers for combination delivery with our aromatic solvents.

Benzol, Nitration	Xylol, Nitration
Benzol, Industrial Pure	Xylol, Ten Degree
Benzol, Industrial 90%	Xylol, Industrial
Benzene, Thiophene-free	Hi-Flash Solvent
Toluol, Nitration	1320 Oil
Toluol, Industrial Pure	Wire Enamel Solvent

All available in Tank Cars and Tank Trucks

OTHER CHEMICALS AND PRODUCTS

- Adipic Acid
- Fumaric Acid
- Resin S (A neutral synthetic resin of high styrene content)
- Specialized Rubber Compounding Materials
- "A-C" Polyethylene Lubricants
- Cyclohexanol
- Cyclohexanone
- Methanol
- Acetophenone
- Ethylbenzene
- Cumene
- Cumylphenol
- Ethylene Glycol
- Diethylene Glycol
- Monoethanolamine
- Diethanolamine
- Triethanolamine
- Flotation Agents
- Pickling Inhibitors
- Tar Distillates
- Tar Acid Oils
- Maleic Anhydride

PLASTICS AND COAL CHEMICALS DIVISION
ALLIED CHEMICAL CORP.
40 Rector Street, New York 6, N.Y.

Please send me specific product data for:

- ☐ Phthalic Anhydride
- ☐ Phenol USP (synthetic)
- ☐ Elastex® Plasticizers
- ☐ Naphthalene
- ☐ Acetone
- ☐ Tar Bases
- ☐ Niacin USP
- ☐ Phenols, Cresylic Acids, Cresols and Xylenols
- ☐ Alpha-Methylstyrene (refined)
- ☐ Cumar® Resin
- ☐ Industrial Aromatic Solvents
- ☐ Other Chemicals and Products

_____

NAME_____

POSITION_____

COMPANY_____

ADDRESS_____

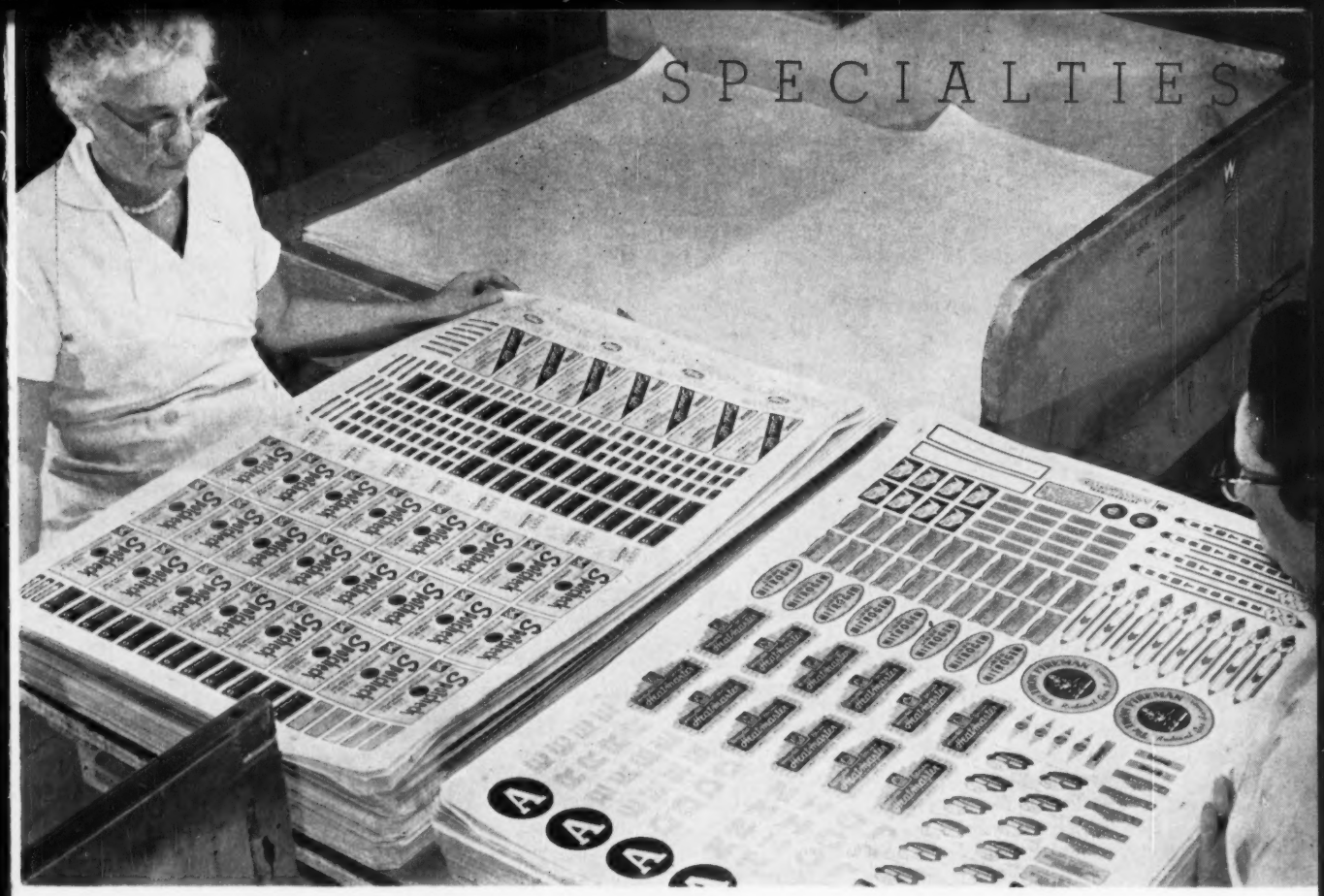
INDUSTRY_____ C12

GET THE LATEST INFORMATION ON COAL-TAR CHEMICALS FROM THE LEADER–

For the convenience of purchasing people in specific chemical industries, we have compiled helpful product data on an industry-by-industry basis. You can have this data by filling out the coupon below, telling us in which industry you work. You'll find it an important assist in keeping all our resources at your finger tips.

Allied Chemical

PLASTICS AND COAL CHEMICALS DIVISION
40 Rector Street, New York 6, N. Y.
In Canada: Allied Chemical Canada, Ltd., 1450 City Councillors St., Montreal



Decal sheets, hot off the press, are inspected for both aesthetic and physical properties.

Decals Make Transfer from Art to Science

This year U.S. industry and government will spend over $50 million on an item many people think went out of style 20 years ago. Decalcomanias, better known as "decals,"* once used chiefly for decorative purposes in the home, have developed into an important utilitarian tagging device for industry. They're now being applied by the millions to hundreds of products ranging from avocados to tank cars, will use $12-15 million worth of chemical products in '60, and are headed for $21 million by '65.

A large share of the credit for the change from consumer to industrial application belongs to the chemical industry, which supplies decal makers with the improved paints, adhesives, resins and films necessary to allow decals to stand up under more rugged conditions.

* Decals can be defined as pictures or designs printed on specially prepared paper for transfer to glass, wood, metal, or other surfaces. Essentially they're images or color layers sandwiched between two layers of transparent paint.

Decal manufacturers who formerly regarded themselves solely as printers are now orienting their thinking toward the chemical field. Their primary concern used to be the appearance of decals; now the physical properties are thought to be just as important as the aesthetic ones.

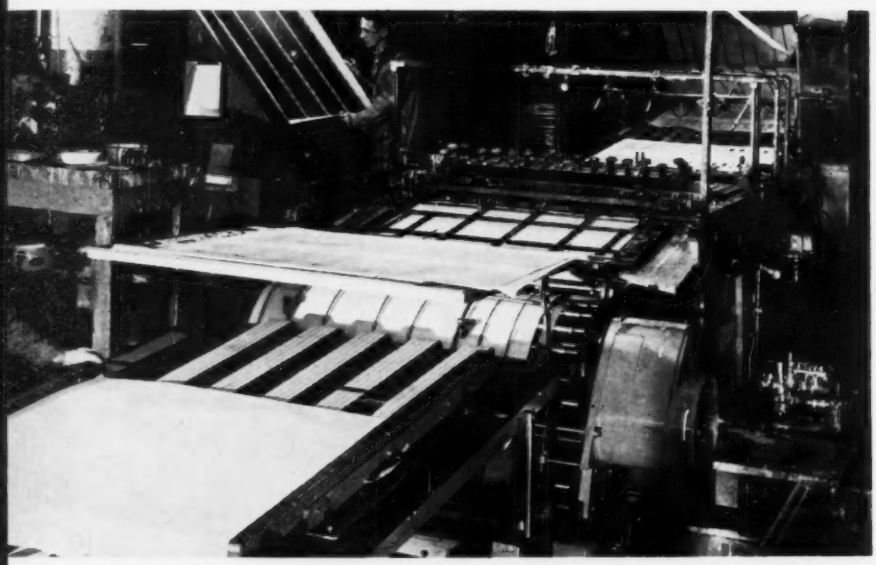
"The decal business is no longer a branch of the printing industry," says Leonard Knopf, vice-president of Chicago's Meyercord Co., acknowledged to be the leader in the industry.

He adds: "It is, instead, a branch of the plastics and ceramic industry." Knopf explains that although graphic arts are continually being developed, "film forming, compatible color systems, self-contained adhesives and, above all, performance on exposure, are major factors in the decal industry today."

Last a Lifetime: Today a decal must meet these criteria, according to manufacturers:

- Organic film decals that are to be applied to organic surfaces should last as long as the substrate. (Most decals manufactured today are in this category.)
- Organic film decals applied to inorganic surfaces such as glass, metal, etc., should have a minimum life of two years.
- Inorganic film decals — such as ceramic decals — applied to inorganic surfaces must equal or exceed the life of the substrate.

Before '45 there were about 10 common decal finishes; today the number runs close to 500. There are often more than 100 chemical ingredients in a decal. Raw materials supplied by the chemical industry include: various film-forming materials —butyrates, acetates, alkyds, crystalline and amorphous polyester films; pulverized ferrous and nonferrous metals; all types of solvents; natural and synthetic rubbers, vitreous fluxes; and a wide range of plasticizers.



Decorating and film-forming are twin functions of decal press.

Decal makers use a special paper, called simplex and duplex paper, supplied by only three companies. Duplex paper can be obtained only from Britain's Ltd. (England); simplex is supplied by Dennison Manufacturing Co. (Framingham, Mass.) and the Ludlow Paper Co. (Ware, Mass.).

Generally, however, decal makers have not developed a special group of raw-material suppliers. Although some companies may specialize in a particular silk screen or paint that goes into decals, no company functions solely as a decal supplier.

Century-Old Industry: The Germans used decals for identifying industrial products as early as 1850; the U.S. industry dates from about the same time. Palm Bros. Decalcomania Co. (Cincinnati, O.) has been making decals for close to a century. (Early uses: lettering on horse-drawn wagons, and scroll decorations for fire engines.)

Today about 400 companies produce decals. Meyercord Co. is the biggest in the field, with anticipated sales this year of $10 million, a rise of $1 million over '59. The company expects a 50% growth by '65.

Other decal firms are American Decalcomania Co. (Chicago); Chicago Decalcomania Co. (Chicago); Palm Bros.; Durachrome Decalcomania Co. (San Francisco); and Commercial Decal (Mt. Vernon, N.Y.). Other significant producers include Dandecal Division of Consolite Corp. (Fremont, O.); Di-Noc Chemical Arts Co. (Cleveland); American Tag Co. (Chicago); Borden Decalcomania Co. (San Francisco).

Consumer Market Dead: The days when consumers bought decals in the dime store to paste on kitchen cabinets and decorate furniture are in the past for the decal industry. Although this type of decal can still be found, many decal makers do not bother to manufacture them now.

Industry is today the biggest and most important user of decals. Many articles that at one time were decorated at home with decals are now industrially decorated by the manufacturers.

This change is actually a renewal of an old marketing pattern—early decal uses in the U.S. were primarily industrial. From 1945 to '50 the consumer market became very large. Since then, the pendulum has swung back to industrial uses.

Who Uses Decals? Decals are used in a wide variety of fields, by nearly every manufacturer who wants a uniform identification tag for his product or equipment. This includes makers of farm equipment, sporting goods, household appliances, furniture, food, tobacco, beverages; all branches and levels of government; materials-handling and transportation companies; the electronics industry.

Advertising is an important function of decals. Product identification and trademarks, window advertising and lettering, point-of-purchase advertising, all use decals.

The brewing industry is cited by one decal maker as its biggest single customer. (Beer companies use decals for point-of-sales advertising.)

On the West Coast decal makers have found profit in some very specialized markets: e.g., Durochrome makes a specialty decal to label avocados, melons, and other fruits. It's estimated that melons sell for 5¢ more when identified with a decal worth about 1.5 mills. And Angelus Pacific Co. (San Francisco) specializes in college stickers.

Decals are often large-quantity items: during World War II, more decals were used on airplanes than on any other parts except rivets; about 1,100 decals went on each plane.

Oil companies—in addition to being big consumers for their equipment and trucks—use about 40 large decals in each service station.

The Ford Motor Co. uses special wood-grained transfers on its station wagons.

Many states use decals for tax stamps, and for cigarettes and liquor bottles.

Variety of Sizes: Sizes in decals vary tremendously. Palm Bros. makes a "pinhead"-size decal used by L. C.

What Is a Decal?

The origin of decals is uncertain, but most authorities seem to think the process is French. The word decalcomania comes from the French decalcomanie, meaning a process of transferring pictures and designs from specially prepared paper to china, glass, etc.

There are two stories about the first users; one lofty, the other somewhat less so:

- *The earliest attributed use goes back to the monasteries of 15th century France. It is said that monks who had the job of decorating skylights and high windows made drawings on transfer paper, then climbed on scaffolds to transfer the designs to windows.*
- *Another more earthy origin is that the word was coined in 1600 by the French royal court, where it was a novelty invented by a courtesan to amuse the court ladies. The decals were applied as beauty marks and tattoos.*

Smith Co. on its typewriters. Smallest decal ever produced by Chicago Decalcomania was an 0.015-in. square Air Force emblem, which was applied to the wing of a model airplane used as a pilot training aid in gunnery practice.

Decals can be made as large as a billboard, or they can cover a 30-ft. trailer.

No Standard Price: Decals, which are actually custom-made items, vary in price, depending on the size, number of colors used, quantity of purchase, art work, and amount of typesetting necessary.

Originally decals were produced on a flat-bed stone lithographic press, making price and product somewhat standard. Today a decal is produced on so many types of equipment that price standardization is difficult. The process makes use of an extruder to produce the film, a roller coaster and dryer for the adhesive, a silk screen press for the design, a vacuum aluminizer for a metallic effect, and a die cutter for the finished decal.

Most of the big decal companies use their own salesmen to sell their products, and Meyercord Co., which emphasizes the importance of the chemical composition of its products, insists on technically oriented salesmen.

Changing Field: Decals were once entirely of the water-activated type, using a water-soluble adhesive; the user soaked the decal in water, the film then slipped off its paper backing. A more recent trend has been to pressure-sensitive decals, which do not require water for application. The film dry-strips away from the waxed paper, depends on a tacky adhesive (an integral part of the film) to stick to a finished item.

It is estimated that today decal production is about equally divided between water-applied and pressure types.

A growing segment of the decal business is in ceramic decals. These are made with glass pigment and are fired directly into pottery or china. Result: a design impossible to distinguish from hand-painted work. A few companies specialize in ceramic decals—e.g., Commercial Decal and Palm Bros.

More Science, Less Art: As the decal industry continues to reorient itself toward the chemical and plastics fields and puts its main emphasis on research rather than printing and graphic arts, it will be looking increasingly to chemical companies for new materials.

Decal use is on the upswing because it is offering a mass-produced and highly durable means of identification, decoration and surface protection for industrial products. Much of this increase is due to improved technology in the plastics field.

Meyercord's Knopf, who thinks the decal industry's next duty is to overcome its "acute case of printer's fixation," sums the future up this way:

"Research today is the determining factor in who survives in the decal industry."

Wash and Waxer

Although U.S. car-polish makers hotly dispute claims by auto manufacturers that the newer car finishes don't need waxing, there is a move by the polish makers to formulate polishes that lay down a thinner coating of wax. Latest company to formulate such a product is Simoniz Co. (Chicago), which has brought out Wax_20.

It is a liquid that is mixed with water (4 oz./gallon of water) and used as a combination washer and waxer. The wiping-down process is said to convert the water-soluble wax into an insoluble substance that gives a gloss finish when buffed. Simoniz is offering the product in a 16-oz. cylindrical can (price: approximately $2), which is said to supply four applications for an average-size car. It is also being boosted for home uses—e.g., on stoves, refrigerators, counter tops and for chrome items.

Although Simoniz claims that its product is the first of its type, a similar product is B.T. Babbitt's Savoy Car Shampoo. That product, which Babbitt purchased from New York's Seeman Brothers last year, also is a combination wax and wash. It's now selling in an 8-oz. size (69¢) and a 12-oz. size (98¢), is said to contain carnauba wax.

More products like the new Simoniz item are likely to appear on the market. The number of motorists who wax their own cars is declining, and ease of application—not price—is the objective of wax makers hoping to stem this trend.

EXPANSION

Midget Aerosols: John C. Stalfort & Sons, Inc. (Baltimore, Md.), has installed a "midget" aerosol filling line for loading pharmaceuticals and cosmetics. The 30-ft. line fills glass, aluminum, stainless steel and steel containers.

•

Southwestern Acquisition: Moore Chemical Co. (Tucson, Ariz.) has been acquired by Industrial Management Corp. Many of the company's industrial cleaning products for the automotive and household fields will be distributed through retail outlets.

•

Detergents Expansion: Curley Co. (Camden, N.J.), now operating from its new, 170,000-sq.ft. plant, will expand its line of private-label detergents. The company also expects to go into dry-powder detergent production, will manufacture some of its own chemicals, produce plastic bottles for cleaning compounds, construct new plants in other sections of the country.

•

Coating Division: W. S. Rockwell Co. (200 Eliot St., Fairfield, Conn.) has established a Plastics Coating Division to provide thermoplastic finishes on metal surfaces for corrosion resistance or decoration.

•

Ground Breaking: Automotive Chemicals Inc. (Alamogordo, N.M.) is building a $150,000 plant to manufacture automotive products under the name of Kar-Kem. The plant is expected to go onstream June 1.

PRODUCTS

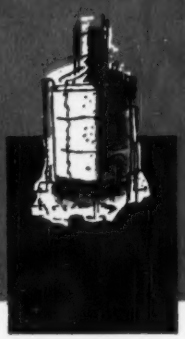
Synthetic Wax Line: Commercial Solvents Corp. (New York) has made available a new series of synthetic waxes. Known generically as oxazoline waxes, they are derived from nitroparaffins. Two of the waxes are now available in commercial quantities: TX-1, a hard, high-melting, light-brown wax, and TS-254, medium melting and cream colored.

•

Tenderer Beef: Swift & Co. (Chicago) has developed a process, tradenamed Pro Ten, using natural food enzymes to tenderize beef. The enzymes, derived from papaya, figs and pineapple, are introduced into the

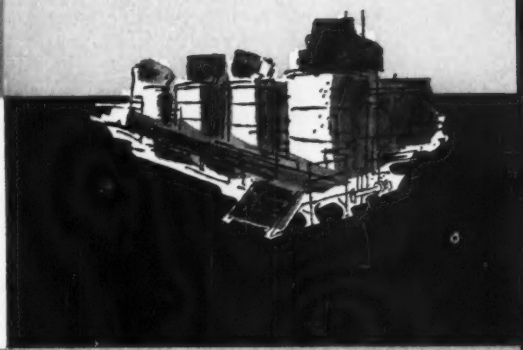
TRULAND. . . *Expands Its Facilities*

- *High Vacuum Processing*
- *High Pressure Processing*
- *By-Product Refining*



NOW . . .

Stainless Steel Reactor for Processing



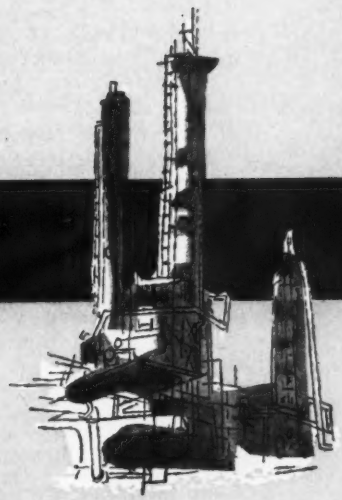
Autoclave Reaction Facilities

Available for all high pressure operations including hydrogenations, ethoxylations and reductions, these facilities and appurtenances provide the answer to industry's need for improved high pressure processing equipment.

Rodney Hunt Stainless Steel TURBA-FILM Processor

Available for obtaining vacua as low as 0.5MM Hg Absolute, Truland's new high vacuum processor is particularly suitable for time-at-temperature-sensitive materials and viscous liquids. Requires just one continuous and swift pass.

Fractionating Facilities



The facilities and experience of Truland may be employed advantageously for the economical upgrading and disposal of solvent mixtures and organic by-products. Our technically trained personnel will gladly discuss your specific requirements and a cordial invitation is extended for you to inspect our new facilities.

Send **for illustrated booklet which describes our operation**

TRULAND

TRULAND CHEMICAL COMPANY Division of THE TRUBEK LABORATORIES

East Rutherford, New Jersey

animals' circulatory systems immediately before slaughter, take effect during cooking. No aging is necessary. Pro Ten-treated meat is now being marketed experimentally in Florida, Indiana, Michigan and Illinois.

•

Specialty Resin: The Chemical Division of Goodyear Tire & Rubber Co. (Akron) is marketing a vinyl dispersion resin for compounding plastisol and organosol formulations. Pliovic WO is said to give desirable flow and gelation characteristics to compounds for plastisol gasketing, slush molding, and roller and dip coating. It has potential uses in fabric coatings for upholstery, awnings and seat covers; and in adhesives for laminating vinyl film to fabric.

•

New Coating: Desco International Assn. (Box 74, Buffalo, N.Y.) has developed a decorative coating for interior and exterior building surfaces. The Tonecrete coatings, over 90% inorganic, are said to withstand oxidation and weather exposure, and to be fire resistant. They come in a wide range of colors and textures.

•

Aerosol Rust Penetrant: The Chemical Division of Supersite Corp. (310 Seymour Ave., Derby, Conn.) is selling a nonoil-base rust penetrant called DU-OL. DU-OL is said to be safe on hot or cold surfaces, and to provide fast penetration and evaporation without leaving residues or stains. Applications are suggested for both industry and households. The product is available in 12-oz. aerosol cans and in sizes up to 55-gal. drums.

•

Bath Tranquilizer: Hagan Chemicals and Controls, Inc. (Pittsburgh), is going into the consumer market with its Calgon Bouquet, a water conditioner and "revitalizing" bubble bath, once distributed only for hotel use. The product is a scented white powder. An 8-oz., foil-wrapped box retails for about 59¢.

•

Glass Coating: Ball Brothers Co., Inc. (9th & Macedonia, Muncie, Ind.), is offering a new coating material—AP (abrasion protection)—for glass containers such as liquor and beer bottles. The coating, approved for use by the Food & Drug Administration, is said to give a more durable protection than stearates, silicones, or emulsion coatings of high-molecular-weight polymers. No special adhesives are necessary in application.

•

Detergent Paper: Kee-Lox Manufacturing Co. (Rochester, N.Y.) has entered the detergent field with its Keel, a soap-impregnated paper for washing dishes, walls, windows. Water causes sudsing in the paper, which can be used as a cloth. A 40-ft. roll sells for 59¢. About 1 ft. of the paper is needed to clean a sinkful of dishes.

•

Oven Cleaner: Chemway Corp. (Mountain View, N.J.) is testing Oven Stick, an oven cleaner in stick form. Price: 69¢/2¼ oz.

•

Dandruff Rinse: Helene Curtis Industries (Chicago) is test marketing its new Wonder Rinse, a medicated dandruff rinse, in New Haven, Providence, and other New England areas. The product, said to be good for all types of hair, sells for $1/bottle.

•

Window Spray: Huntington Laboratories (Huntington, Ind.) is offering its Window-San window cleaner in a 15-oz. aerosol bottle. Addition of a foaming agent reportedly speeds up washing and polishing.

•

Pink Grapefruit Juice: U.S. Dept. of Agriculture has developed a method of producing naturally colored juice from pink grapefruit. The color-bearing pulp (normally removed) is finely ground and added to the juice. The product also is said to contain higher amounts of provitamin A.

•

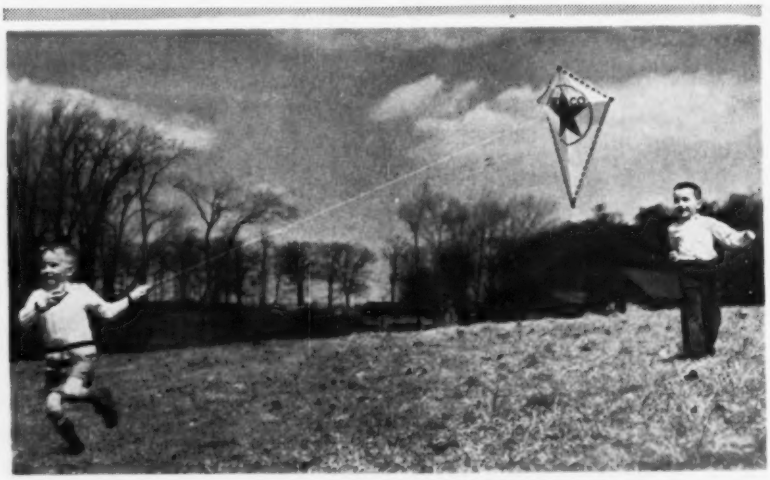
Baby Shampoo: Shulton Inc. (New York) has introduced Cair-x, claimed to be the first aerosol baby shampoo, in Syracuse drug and department stores. Retail price: 98¢/6¾-oz. can.

•

Molding Process: The Sterling Alderfer Co. (3850 Granger Rd., Akron) has developed a process to produce continuous lengths of polyurethane foam with molded shapes.

•

Spray Starch: Aerosol Corp. of America (Wellesley Hills, Mass.) has added Glis, a spray starch, to its line of aerosol products. The 14-oz. can sells for 79¢.



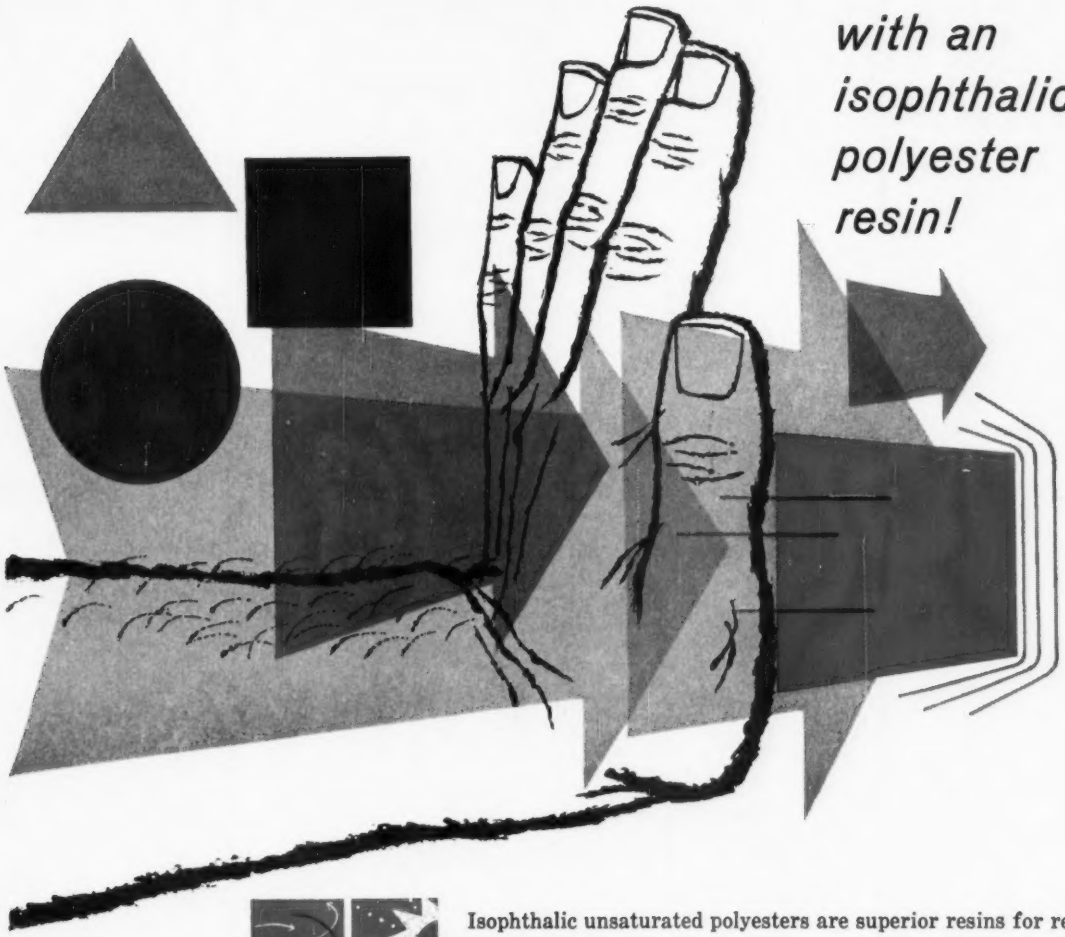
High-Flying Promotional Campaign

Over 1 million kites—prominently displaying the Texaco emblem—will be distributed to Canadian kids in the next four months as a new service-station promotion idea. The kites, which are "guaranteed" to fly are made from 1.5-mil, white polyethylene film manufactured by Du Pont of Canada at its new Whitby, Ont., plant. The kite assembly kit — instructions for which are printed in both French and English—includes the polyethylene kite-skin, metal struts, adhesive tape, and nylon cord to bow the completed kite.

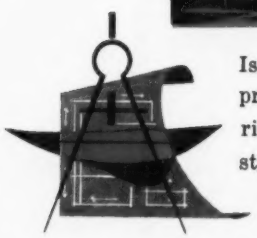
Texaco Canada Ltd., which will be offering the kits through most of its dealers, had the kites designed and produced by Wylie & Wiggins Co., Ltd. (Toronto).

Push your product **OUT FRONT**

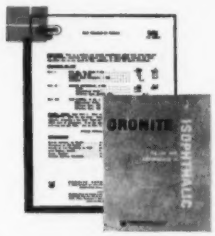
with an isophthalic polyester resin!



Isophthalic unsaturated polyesters are superior resins for reinforced plastics products — providing greater physical strength, impact resistance; improved flexibility and adhesion; better heat distortion properties — *on exposure to time, temperature, water and weather.*



Isophthalic polyester resins offer manufacturers, designers, engineers and production people improved properties for planning better products to more rigid specifications and convenient production methods. More attractive product styling, better performance and greater reliability are all now possible.

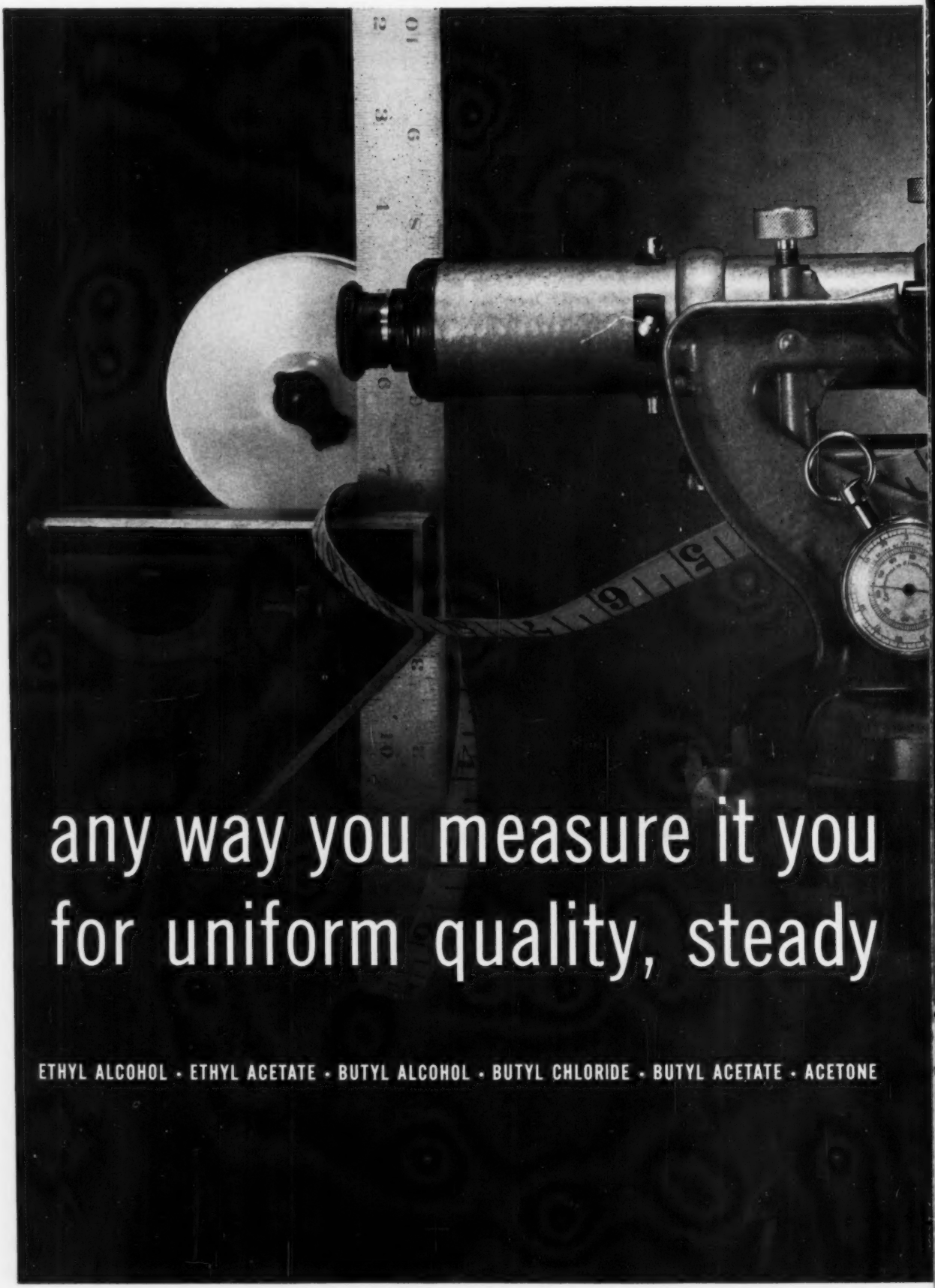


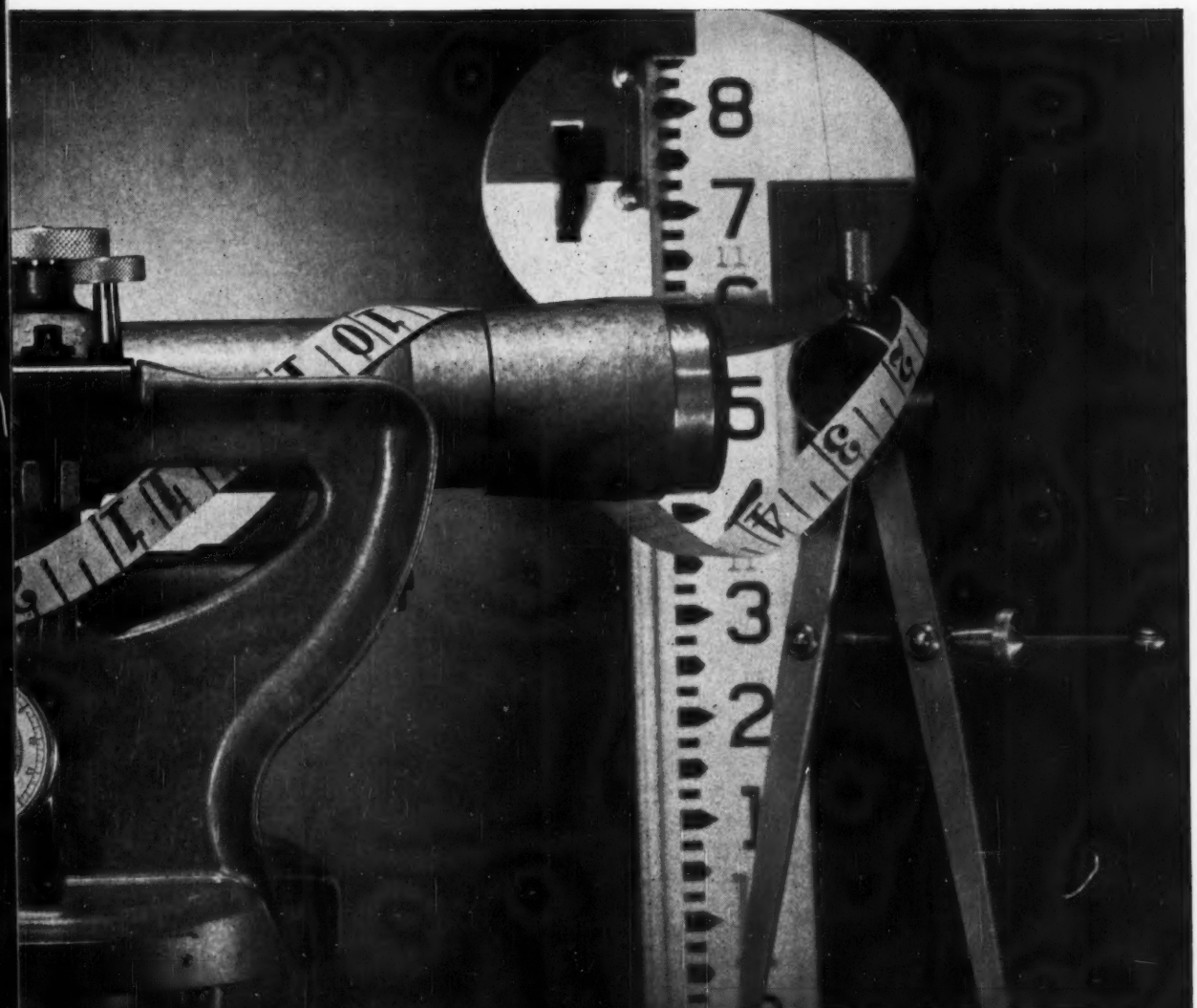
Ask your resin supplier about Isophthalic polyesters or request Isophthalic polyester information and formulations from Oronite. Just contact the Oronite office nearest you.

ORONITE CHEMICAL COMPANY
A CALIFORNIA CHEMICAL COMPANY SUBSIDIARY

EXECUTIVE OFFICES • 200 Bush Street, San Francisco 20, California
SALES OFFICES • New York, Boston, Wilmington, Chicago, Cincinnati, Cleveland, Houston, Los Angeles, San Francisco, Seattle
FOREIGN AFFILIATE: California Chemical International, Inc., San Francisco, Geneva, Panama

6409


any way you measure it you
for uniform quality, steady
ETHYL ALCOHOL · ETHYL ACETATE · BUTYL ALCOHOL · BUTYL CHLORIDE · BUTYL ACETATE · ACETONE



can depend on PUBLICKER supply and prompt delivery

ACETALDEHYDE • ACETIC ACID • AMYL ACETATE • REFINED FUSEL OIL • ISOAMYL ALCOHOL • PROPRIETARY SOLVENT

PUBLICKER INDUSTRIES INC.

1429 WALNUT STREET, PHILADELPHIA 2, PA.

NEW YORK • NEW ENGLAND • PUBLICKER ALCOHOL & CHEMICAL SALES CORP.

PHILADELPHIA—LOCUST 4-1400 • NEW YORK—OXFORD 5-4160 • BOSTON—HOMESTEAD 9-0022

MIDWESTERN DISTRIBUTORS, PUBLICKER CHEMICAL CORP.

CHICAGO—RANDOLPH 6-6678 • WESTWEGO, LOUISIANA—UNIVERSITY 6-2727

Acrylic Fibers: Famine Amid the Feast

Estimated End-Use for Acrylic Fibers ('59)

	Million pounds
Knit sweaters	60-70
Carpets and rugs	10-12
Broad woven and apparel	8-10
Knit jersey	5-6
Knit pile (includes scatter rugs, liners, imitation fur, etc.)	4-5
Blankets	5
Industrial uses	1
Exports	20
Misc. (fiber fill, assorted apparel, etc.)	10-15

By the end of this year, when U.S. acrylic fiber demand will be approaching the 160-million-lbs./year mark, producers will still see two sides of the acrylic picture.

Bright: acrylic fiber demand is now second only to kingpin nylon (375 million lbs.) among noncellulosic fibers.

Dark: of the six producers now active in the field, only two will be showing any real profits.

Although demand for acrylic fibers is now only about 70% of capacity, expansion plans to meet '65 needs are already being contemplated.

Indications are that the acrylics demand will grow at a 20-million-lbs./-year clip over the next five years, wind up with a '65 consumption of approximately 250 million lbs. Reason for the rather heartening acrylic outlook—despite isolated misgivings on the near-term future of textiles as a whole—lies in success of newer developments (e.g., acrylic filaments, texturized yarns), and anticipated broadening of now-minor outlets. And, this is expected to be the payoff for those firms—just starting, or contemplating—entering this highly competitive field.

Decade of Growth: Growth of acrylics during the last 10 years has been encouraging, and has no doubt whetted the appetite of several producers.

Commercial availability dates back to '50, when Du Pont started production of Orlon at its Camden, S.C., plant. Since that time, demand for acrylic fibers has climbed steadily upward, broke the 100-million-lbs./-year mark by '58 (about 10-11 million lbs. of this was export).

In '59, output increased another 32%, as domestic consumption moved past the 100-million-lbs. mark, to 120 million lbs. Exports last year also hit a record high of a little over 20 million lbs.

The estimates for this year of course depend on a stable second-half '60, but there's little reason to think it will be below 155 million lbs.

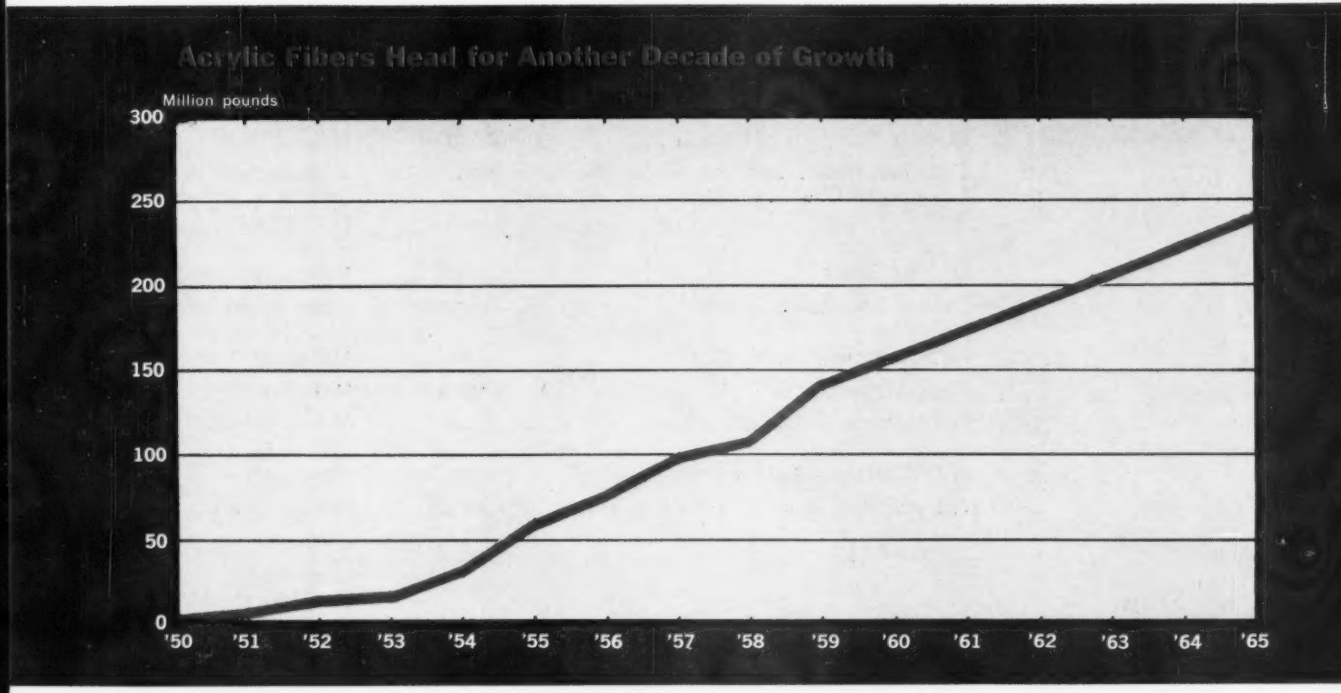
As for '65's outlook, on the conservative end is Chemstrand's President Edward O'Neal, Jr.'s estimate that acrylic fiber sales would hit 237 million lbs./year by '65. More-optimistic observers look for sales to be around 250 million lbs./year.

Hard on Cellulosics: Not only are the acrylic fibers growing poundwise, but they have also managed to carve out a larger chunk of the noncellulosic market, a trend that is expected to continue during the next five years.

Acrylics commanded 16% of the noncellulosic market by '55, which includes nylon, polyesters and smaller-volume fibers such as saran, the olefins, etc. This figure was 20% by '57, and last year rose to 22½%, a little more than 0.5% above '58. By '65, acrylics should take a quarter of the noncellulosic market.

Two to Grow, Two to Show: Acrylics has not always been a profitable operation, and all producers have lost money in market development. Du Pont's Orlon has been in the black for about 4-5 years, while Chemstrand's acrylic operations started to pay off only within the past two years.

Currently, the industry's two pure-acrylic newcomers, Dow and American Cyanamid, are going through the baptism of fire. Dow's 15-million-lbs./year plant at Williamsburg, Va.,



came onstream in '58, while American Cyanamid started operations of a 27-million-lbs./year unit at Pensacola, Fla., in the early part of '59. Both producers are battling hard to establish themselves in this highly competitive field. But last year Creslan output was estimated at only about 2½ million lbs., while Zefran output was about 1 million lbs.

Also primed for this market are the modified acrylics (modacrylic).*

Big problem facing Creslan and Zefran is the entrenchment of Du Pont's Orlon and Chemstrand's Acrilan in specific end-uses. The newcomers have the unhappy choice of wresting away part of these markets, or developing new ones—neither job is an easy or cheap one.

Shaping Up in Sweaters: The Orlon and Acrilan market development programs taught some valuable lessons in fiber selling.

Du Pont was able to combine acrylics' pleasant hand and high bulking power with Orlon's ability to accept a wide range of bright colors, to win more than 50% of the women's sweater market, and 20% of the men's sweater trade for its trademark. This is the largest outlet for acrylics, and is still dominated by Orlon, which accounts for 90-95% of the total acrylics used. And, Du Pont is not letting up. This week, on its June Allyson Show, special commercial time was given to promoting Orlon "tote" sweaters.

Rolling Out the Carpet: Unable to get a hold in the sweater field, Chemstrand sought other outlets for Acrilan. It pushed hard in the rug and carpet field. Result: in '59, about 30% of Acrilan output went into this use. Besides holding a dominant position in the carpet field, Acrilan has also captured a large part of the blanket and knit jersey markets.

But competition in carpets will be getting keener. Last week, Creslan carpet fiber made its debut, and earlier this year Du Pont also made its bid for this market when it introduced its first Orlon carpet fiber.

All acrylic fiber makers are worried about the impact of texturized nylon, which now threatens seriously to cut into the sales of acrylics. Big question: will nylon help expand the carpet market for all synthetics, or will it cut deep into acrylics' share of the market?

Capacity More than Enough: U. S. acrylic fiber capacity now in place totals approximately 230 million lbs./-year. Despite the apparently unfavorable ratio of capacity to consumption (230 million as against 160 million for '60), more production facilities will be needed to fulfill anticipated '65 requirements.

Du Pont, largest acrylic fiber producer—it can now turn out about 120 million lbs. of Orlon annually at Camden, S. C., and Waynesboro, Va. —may be already contemplating an increase. Early last fall, for instance, Andrew Buchanan, Jr., Du Pont's Textile Fibers Dept. general manager, said that his company had plans for "current and projected expansions" that would eventually boost its total synthetic fiber capacity to about 600 million lbs./year. It is believed that 170 million lbs. of this total would be for Orlon. Currently Du Pont is op-

* Modacrylics: fiber having less than 85% but at least 35% acrylonitrile units by weight. Acrylics: fiber having more than 85% acrylonitrile units by weight.

World Acrylic Fiber Producers

	Company	Tradename	Remarks
Belgium	"Fabelta" (Union Des Fabriques Belges De Textiles Artificiels S. A.)	Acrybel	Pilot plant, makes staple.
Canada	Du Pont Company of Canada Ltd.	Orlon	Makes staple.
	Canadian Resins and Chemicals, Division Shawinigan Chemicals Ltd.	Algil	A modacrylic of polyacrylonitrile - styrene (monofilaments).
France	Societe Crylor	Crylor	Makes yarn and staple.
	Societe Courtaulds France	Courtelle	Plans to build staple plant.
West Germany	Farbenfabriken Bayer A. G.	Dralon	Makes yarn and staple
	Phrix Werke A. G.	Redon	Makes staple.
	Suddeutsche Zellwolle A. G.	Dolan	Makes staple.
East Germany	VEB Filmfabrik Agfa Wolfen	Wolcrylon	Makes yarn.
	VEB Kunstseidenwerk "Friedrich Engels"	Prelana	Makes staple.
Italy	Societa ACSA	Leacril	Jointly owned by The Chemstrand Corp. and Societa Edison of Milan. Makes staple.
Japan	Asahi Kasei Kogyo KK	Cashmilon	Makes staple.
	Kanekalon KK	Kanekalon	Makes modacrylic staple.
	Mitsubishi Vonnel KK	Vonnel	Makes staple. A Chemstrand affiliate. Capacity 15 million lbs.
	Nippon Exlan Kogyo KK	Exlan	Makes staple.
	Nitto Boseki KK	Nitlon	Pilot plant, makes staple.
	Teijin Acryl KK	——	Pilot plant, makes staple.
	Toho Rayon KK	Beslon	Pilot plant, makes staple.
	Toyo Rayon KK	Toraylon	Pilot plant, makes staple.
Netherlands	N. V. Kunstzijdespinnerij NYMA	Nymcrylon (staple), Nymkron (tow)	——
	Du Pont (Nederland) N. V.	Orlon	Capacity 15,000 lbs., due onstream in '61.
Poland	Lodzkie Zaklady Wlokien Sztucznych	Anilana	Pilot makes staple.
Romania	State Owned	Rolan	Makes staple.
Spain	Acetorgan S. A.	——	
Sweden	Stockholms Superfosfat Fabriks AB	Tacryl	Makes staple.
U.S.S.R.	All State-Owned Plants	Nitron or Nitrilon	——
	" " "	Saniro or Saniv	Modacrylic-type product.
United Kingdom	Chemstrand Ltd.	Acrilan	Makes staple.
	Courtaulds Ltd.	Courtelle	Makes staple.

Source: Textile Organon.

erating at about 80% of capacity, turning out approximately 95 million lbs./year of Orlon.

Chemstrand with over 50-million-lbs./year capacity for Acrilan at Decatur, Ala., is another logical candidate for a capacity increase: it is already producing at 70% of capacity on a volume of about 35 million lbs./year of Acrilan.

Also ripe for further expansions, or even a new plant venture, are the two modacrylic producers, Union Carbide (Dynel), and Tennessee Eastman (Verel). Although small, in comparison, with acrylic producers, both are reported to be pushing their facilities at close to capacity.

No doubt both are debating whether to build new plants for their product. If new plants are planned, it's a good bet capacity would have to be at least 25-30 million lbs./year.

Growing Markets: Any expansions, however, will likely hinge on the producers' scoring in the apparel business. Currently all producers are promoting their product in suits, slacks and coatings, for the fall season.

Here, unlike other applications, acrylics are being used in combination with other fibers such as wool or polyesters.

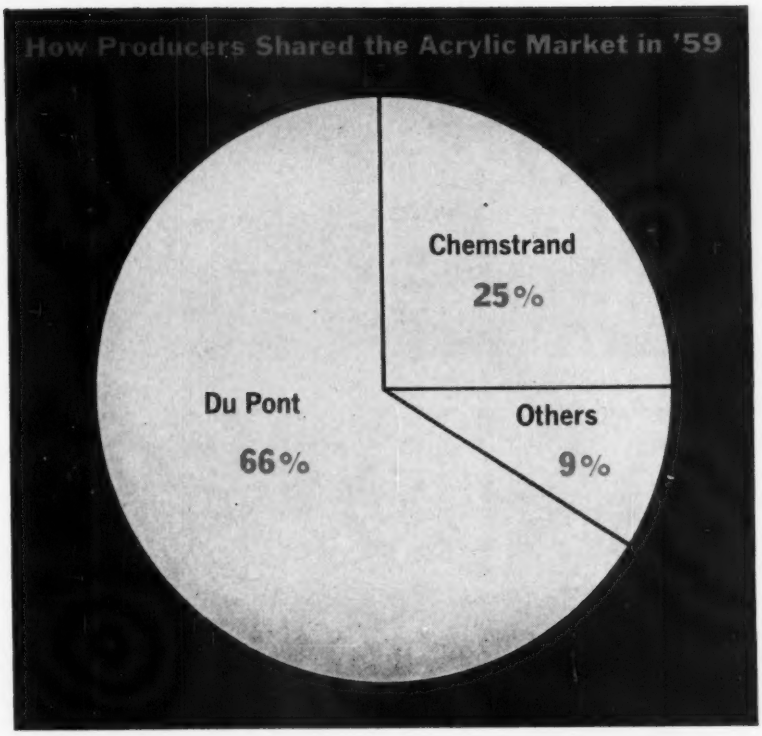
Sweaters still show promise; new demands are being created by the introduction of style sweaters, to supplement the classic sweater line. And with air conditioning, sweaters are being promoted as an all-year-round item.

Sales of blankets will also grow, although competition from low-priced wool, will present some tough competition.

Knit pile fabrics, which include pouff rugs, scatter rugs, liners, imitation fur, etc., also are a promising area for future growth.

One of the keys to acrylics' future growth is to be found in the tailoring of the acrylics to specific end-uses.

Since acrylics' end-uses go right across the textile board, one size of denier, or one staple length, is not enough to compete in all markets. (In one application, acrylics could be used for a sweater; in other areas it could be used to make a rug.) Because of these different requirements, it has become necessary for producers



Acrylic Fiber Lineup

	Tradename	Capacity (millions of lbs.)	Fiber Classification
American Cyanamid			
Pensacola, Fla.	Creslan	27	Acrylic
The Chemstrand Corp.			
Decatur, Ala.	Acrilan	50	Acrylic
E. I. Du Pont			
Camden, S. C.	Orlon	80	Acrylic
Waynesboro, Va.	Orlon	40	Acrylic
Dow Chemical Co.			
Williamsburg, Va.	Zefran	15	Acrylic
Tennessee Eastman Co.			
Kingsport, Tenn.	Verel	5	Modacrylic
Union Carbide Corp.			
South Charleston, W. Va.	Dynel	6-8	Modacrylic

Du Pont's Demme—'Orlon's key to future: specificity, diversification.'

Chemstrand's Powers—'Acrilan looks to new markets for sustained growth.'

CW PHOTO—ED WALLOWITCH

Cyanamid's Loosli—'Creslan will get its share of this growing market.'

Dow's Ruddock—'Field is competitive, but Zefran's outlook is promising.'

to inventory a large variety of fibers, to compete in all markets.

Du Pont reports that it now carries 10 different Orlon product lines, and inventories about 280 different varieties of these fibers (includes different deniers, staple lengths, lusters, chemical and physical properties, etc.).

Additional growth is also expected from filament yarns. Du Pont, recently reintroduced an acrylic yarn which is trademarked Orlon Cantrece. (Du Pont's first acrylic product was a filament yarn, called Orlon 81. It was later discontinued because of poor dyeability.) While fabrics made from acrylic staple have a hand similar to wool, the acrylic filament gives a silk-like hand. Because of the cost, first market being sought is in luxurious apparel where the filament gives the look and feel of silk. Undergarments and lingerie are other possible outlets for this product, but will depend on lower prices for the yarn.

Carbide and American Cyanamid are also active in this area, and both are sampling their own filaments to the trade. Chemstrand's product is still in the prepilot-plant stage.

Overseas Expansion: Acrylic producers are already in the overseas market, either shipping their product out of the country, building abroad, or licensing know-how.

During '59, three overseas plants in which Chemstrand had an interest went onstream. In early spring, the 10-million-lbs./year Northern Ireland plant of Chemstrand Limited, a wholly owned subsidiary, turned out its first bale of Acrilan. About the same time, the company's Japanese affiliate, Mitsubishi Vonnel Co. Ltd., started its 15-million-lbs./year plant for making Vonnel. By mid-year, Chemstrand's Italian affiliate, Applicazioni Chimiche Societa per Azoioni (ACSA), had started its Porto Marghera unit, where plans are already under way to double the production capacity.

Du Pont is also going overseas and through its subsidiary, Du Pont de Nemours (Nederland) N. V., will put up a 15-million-lbs./year unit at Dordrecht in the Netherlands. Expected startup date: late '61. Du Pont's other non-U.S. Orlon plant is in Canada.

In Japan, American Cyanamid has licensed one of the Japanese firms, Nippon Exlan Kogyo KK, to use its process to make Exlan.

Overseas Peril: But, the paradox of the situation is that plants springing up overseas present a real threat to the acrylic industry in the next few years. Japan in particular seems a threat. Because of its terrain, and inability to grow enough fiber to meet home demands, Japan has put a lot of emphasis on synthetic fiber developments.

At present, Japan's capacity for acrylic fibers is an estimated 80-100 million lbs./year. Some of this material is already starting to find its way into the U.S., in the form of sweaters and finished fabrics (fiber has also been imported).

But, not only has Japan become a big acrylic producer; it is also selling know-how to other countries. One report is that Russia is seeking Japan's help in acquiring acrylic fiber knowledge.

From Europe, too, some acrylic has entered the U.S. for as low as 50¢/-lb. At the present this is not too great a threat because delivery time is reported to be about 10 weeks.

Still the danger from overseas imports is real, and could become a very serious problem.

With the field crowded (four commercial producers and two potential newcomers) with profits being eroded by heavy promotional and advertising expenses, and with always rugged competition in fiber marketing, its obvious that no producer can take a breathing spell during the next five years of acrylic fiber growth.

FEELS DRY... top compatibility with FLEXOL PLASTICIZER EPO

No oily film . . . no dirt pick up. These are the big advantages CARBIDE has built into FLEXOL Plasticizer EPO.

This premium-grade, high-molecular-weight, epoxy plasticizer demonstrates its top-level compatibility in vinyls even after hundreds of hours of rigorous testing. FLEXOL EPO gives your vinyl products full sales appeal at purchase, and lasting satisfaction in use.

Only two to seven parts of FLEXOL EPO per 100 of resin are required for stabilizing purposes. For dual use as a stabilizer-plasticizer, concentrations of only 10 to 50 per cent of the total ingredients are needed. Primary plasticizers such as FLEXOL DOP can be used easily with EPO.

FLEXOL EPO and other members of CARBIDE's big family of vinyl plasticizers are readily available in money-saving compartment tank cars and trucks, carloads, truckloads, and drums in LCL shipments.

For prices and full specifications on FLEXOL EPO, call the CARBIDE Technical Representative in your area. Or write: Union Carbide Chemicals Company, Division of Union Carbide Corporation, 270 Park Ave., New York 17, N.Y.

UNION CARBIDE CHEMICALS COMPANY

UNION CARBIDE

Solve your odor problems with Shell Solvents

You'll sell more paint with these solvents . . . preferred for low odor and odorless products.

Shell Sol 71 and 72 . . . have no odor, are ideal for interior finishes, polishes and cleaners. Shell Sol 71 offers slightly faster evaporation.

Shell Sol 360 . . . much faster evaporation than mineral spirits, low odor, over 100°F. flash point.

Shell Sol 140 . . . a high-flash, slower drying solvent with unusually low odor.

Shell Mineral Spirits . . . traditional distillation range, solvent power and drying. Mild odor.

Typical properties of these Shell Solvents are contained in booklet shown. It will be mailed on request.

FACT—FROM SHELL RESEARCH

Odor stability is important.

SHELL OIL COMPANY

50 WEST 50TH STREET, NEW YORK 20, NEW YORK
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

SHELL

Technology
Newsletter

CHEMICAL WEEK
June 11, 1960

General Electric's bid to enter the small-size industrial gas turbine business—via importing a 100-hp. unit from Bavarian Motor Works (Munich, Germany) (*CW Technology Newsletter, Feb. 20*)— has hit a snag. Last week the technology-rich, but nearly bankrupt, BMW rejected an offer of financial aid from GE, instead accepted one from Germany's MAN (Augsburg-Nuremberg Machine). Both GE and MAN are keenly interested in the automaker's subsidiary BMW-Triebwerk, GmbH, which will soon receive a $100-million contract to build the lower plant for the West German Air Force's F-104 Starfighter.

GE was in the midst of licensing negotiations with BMW for the 100-hp turbine when word of the MAN financial agreement was received. GE says it's not prepared to comment on what effect the MAN offer will have on its gas turbine negotiations. But there is one point in GE's favor: BMW will be building J-79 power plants for the Starfighter under license from GE.

Among gas turbine makers, GE isn't the first to look to Europe for help. For example, Clark Brothers Co. (Olean, N. Y.) went to Ruston and Hornsby, Ltd., in England for industrial gas turbines several years ago. Cost is a major factor. U. S. turbine makers have a higher break-even point, have trouble making small industrial gas turbines economically. The break-even point differs somewhat among companies, but is usually about 4,000 hp. The problem: regardless of turbine size, the number of parts remains about the same.

•

A new continuous gasification process for making water gas from low-grade coal is under study at the London Research Station of Britain's Gas Council. A $630,000 pilot plant designed to produce about 2 million cu.ft./day of water gas is scheduled to start in about a year.

The process involves forcing powered coal with air, oxygen or steam into a bed of molten slag. The coal is gasified completely and continuously, leaving only ash, which becomes part of the molten slag bed. The conventional water-gas process, on the other hand, is a cyclic operation—alternating between a "steam blow" in which steam is decomposed over a bed of incandescent coke, and an "air blow" to revive the partly quenched bed.

Development of the new process has been sparked not only by the progressive shortage of coking coals in Britain but also by an increasing need for lean gas of low calorific value. Lean gas is needed to adjust the calorific value of Britain's increasing quantities of rich gases from refinery tail gases, gasification of oil and methane imports.

•

Union Carbide has entered the extra-permanent antifreeze race with Prestone Long-Life Coolant, but the company will continue to stress regular Prestone in its marketing.

The new product, glycol based, with an improved inhibitor system, will sell for $5/gal., the same price as Du Pont's new Telar (*CW, April 23, p. 113*). However, Carbide declines to specify how long its product will last, says only that it "provides superior protection for extremely long periods to all cooling system metals, including aluminum." R. P. Bergan, vice-president of Union Carbide Consumer Products Co., points out that only the local dealer can judge when the new coolant should be drained, based on his knowledge of the individual cooling system and of the conditions under which the car is run.

•

Meanwhile Du Pont's final U. S. patents on Telar have issued. One (2,937,145) covers a mixture of ethylene glycol (90-96%), sodium metaborate (0.5-7.5%), phenol red indicator (0.01-0.5 g./liter) and water. Another patent (2,937,146) is similar, but lists a number of alternative indicator compounds that could be employed.

•

New thyroid extracts that lower blood cholesterol levels without affecting the heart, a previous drawback of such preparations (*see p. 45*), have been uncovered at University of California Medical School (Los Angeles). They are triapron and tetraiodothyroformic acid. Both have been used succesfully over a 12-month period on 49 thyroid-sensitive patients, most of whom had heart disease. In 40 of the patients, a favorable cholesterol-lowering effect was noted. High cholesterol levels have been implicated as a cause of heart attacks and brain strokes.

•

Newest nuclear yardstick is zinc-67—an isotope whose electromagnetic radiations permit tiny variations of energy to be measured with nearly a thousand times the accuracy afforded by the best previous standard.

By combining techniques of nuclear and solid-state physics and cryogenics, a team of Los Alamos Scientific Laboratory researchers discovered what they term "ultrahigh-resolution gamma ray resonance." Dime-size crystals containing zinc-67 and cryostat-cooled to −454 F by liquid helium reportedly measure gamma ray vibrations with a sensitivity of two parts in a million billion (10^{15}). Potential applications: investigation of minute influences on nuclei; studies of nuclear structure; timing standard for the most precise nuclear "clock" thus far available.

•

A new phthalic anhydride catalyst, designed to provide high yields from either naphthalene or ortho-xylene, or mixtures of the two, was disclosed this week by Scientific Design. *O*-xylene as a starting material for phthalic is'nt new. Oronite's phthalic process is based on *o*-xylene; other phthalic producers have used it during critical shortages of naphthalene (*CW, April 6, '57, p. 32*). And Standard Oil of Indiana's xylene oxidation process, developed by SD, handles ortho as well as the other xylene isomers. But *o*-xylene is trickier to oxidize, generally gives lower yields when catalysts tailored for naphthalene feedstock are used. First plant to employ SD's new catalyst is now being designed for a European client.

platinum, platinum-palladium and platinum-rhodium-palladium alloy gauze catalysts for industry

BAKER PLATINUM DIVISION

The catalytic properties of the platinum metals, plus their corrosion resistance at extreme temperatures, enable gauzes made from these materials to be utilized as the only practical catalysts for various commercial chemical reactions.

Despite the initial expense encountered in the purchase of the precious metal gauze, the investment for the catalyst is only a very minor factor in the final cost of the finished product. Generally, platinum gauze catalyst is the basis for the most efficient and economical catalytic procedures. The uses for platinum and platinum alloy gauze in the chemical industry include the manufacture of nitric acid, chamber sulphuric acid and hydrocyanic acid.

Engelhard research and experience in the development of platinum gauze catalysts for the chemical industry is at your service. Write for literature.

BAKER PLATINUM DIVISION • 113 ASTOR STREET
NEWARK, N. J.

ENGELHARD
INDUSTRIES, INC.
EXECUTIVE OFFICES:
113 ASTOR STREET • NEWARK 2, NEW JERSEY

CHEMICAL DIVISION

MINOXO INDICATOR

SUPER-SENSITIVE DEOXO INDICATOR

for detection and measurement of oxygen or hydrogen impurities in other gases

MINOXO INDICATOR... measures traces of molecular oxygen in other gases—from 1 to 10 parts per million, and from 1 to 100 PPM. High sensitivity and rapid speed of response enable it to be used for laboratory investigation and production quality control.

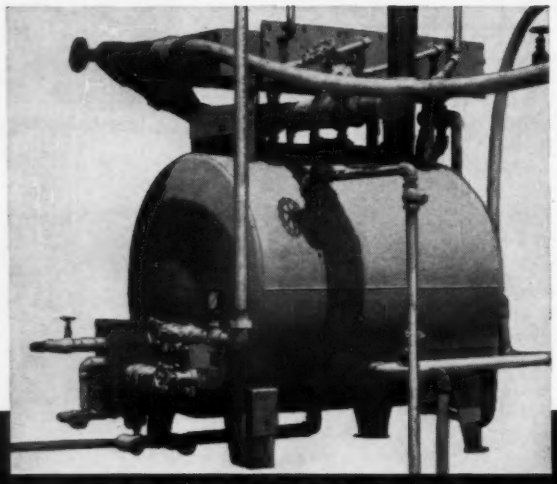
SUPER-SENSITIVE DEOXO INDICATOR... measures oxygen or hydrogen present as impurities in other gases—from 2 to 200 parts per million oxygen and 4 to 400 parts per million hydrogen. Dual range permits measurement up to .25% oxygen or .50% hydrogen. Send for literature.

CHEMICAL DIVISION • 113 ASTOR STREET
NEWARK, N. J.

DOMESTIC DIVISIONS: AMERICAN PLATINUM & SILVER DIVISION • AMERSIL QUARTZ DIVISION • BAKER CONTACT DIVISION • BAKER DENTAL DIVISION • BAKER PLATINUM DIVISION • BAKER SETTING DIVISION • CHEMICAL DIVISION • HANOVIA LIQUID GOLD DIVISION • INSTRUMENTS & SYSTEMS DIVISION • IRVINGTON-BAKER REFINING DIVISION • D. E. MAKEPEACE DIVISION • RESEARCH & DEVELOPMENT DIVISION • H. A. WILSON DIVISION. COMPANIES ABROAD: ENGELHARD INDUSTRIES OF CANADA, LTD., TORONTO • ENGELHARD INDUSTRIES LTD., BAKER PLATINUM DIVISION, HANOVIA PRODUCTS DIVISION, LONDON • SOCIEDAD SURAMERICANA DE METALES PRECIOSOS S.A., BOGOTA • ENGELHARD INDUSTRIES S.A.R.L., PARIS • ENGELHARD INDUSTRIES A/S. COPENHAGEN • GLOVER & GOODE PTY., LTD., MELBOURNE • ENGELHARD INDUSTRIES, K.K., TOKYO • ENGELHARD INDUSTRIES, PTY., LTD., MELBOURNE • ENGELHARD INDUSTRIES, LTD., ZURICH • INDUSTRIE ENGELHARD S.P.A., ROME • GUILIANO STACCIOLI-METALLI PREZIOSO S.P.A., ROME • INVERSIONES EN INDUSTRIES NACIONALES, S.A., BOGOTA. ASSOCIATED COMPANIES: KALIE-CHEMIE-ENGELHARD KATALYSATOREN G.M.B.H., HANOVER

PROMPT PRECIOUS METAL SCRAP RECOVERY SERVICE • ENGELHARD PROCEDURES RECOVER 100% OF ASSAYED PRECIOUS METAL CONTENT • IRVINGTON-BAKER REFINING DIVISION

A new and better Tank Cleaning Process by



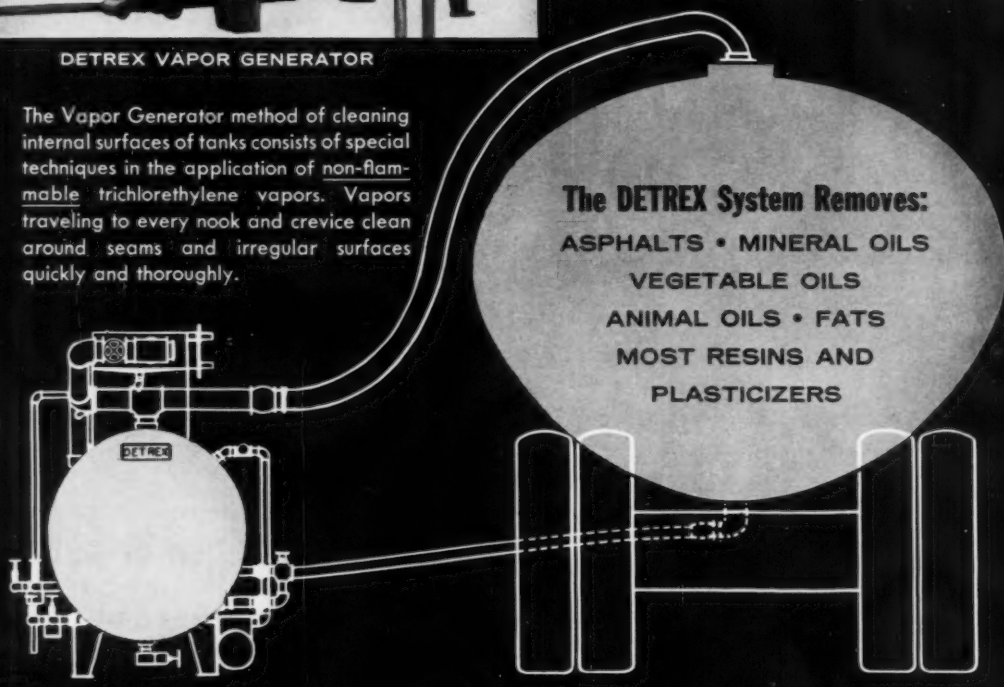
DETREX VAPOR GENERATOR

DETREX

FAST— SURE— LOW IN COST

(Vapor clean a 5000 gallon tank in approximately 20 minutes)

The Vapor Generator method of cleaning internal surfaces of tanks consists of special techniques in the application of non-flammable trichlorethylene vapors. Vapors traveling to every nook and crevice clean around seams and irregular surfaces quickly and thoroughly.



The DETREX System Removes:

ASPHALTS • MINERAL OILS
VEGETABLE OILS
ANIMAL OILS • FATS
MOST RESINS AND
PLASTICIZERS

Tough Jobs Made Easy!
Compare these advantages of Vapor Generator Cleaning

Quality of cleaning eliminates the need for gradual upgrading • Greater fleet utilization • Clean reusable trichlorethylene is recovered from contaminated solvent and can be used over and over again • Low heat requirement; no drying required • Remarkable cost savings.

DETREX IS A MAJOR MANUFACTURER OF THE CHLORINATED SOLVENTS — TRICHLORETHYLENE AND PERCHLORETHYLENE

DETREX CHEMICAL INDUSTRIES, INC.

Box 501, Dept. CW-660, Detroit 32, Michigan

OSW's Five Demonstration Projects

Process	Location	Designer
1 Long-tube vertical multiple-effect evaporation	Freeport, Tex.	W. L. Badger & Assoc.
2 Nuclear-heated, multiple-effect flash distillation	Camp Pendleton, Calif. Port Hueneme, Calif.	Fluor Corp., Ltd.
3 Electrodialysis	Webster, S.D.	Probable choice: Ionics, Inc.
4 Vapor compression, forced circulation	Roswell, N.M.	Leading contenders: Griscom-Russell Co., Cleaver-Brooks Co., Bethlehem Steel Co., Mechanical Equipment Co., Whiting Corp.
5 Freezing	East Coast	Probable choice: Carrier Corp., Blaw-Knox, or a combination

Freeze Process Heats Up Desalting Race

The Office of Saline Water's high hopes for the eventual commercial success of a freezing process for desalting sea water was underscored by last week's disclosure of a new candidate for the job (CW Technology Newsletter, June 4, p. 57). The process, developed jointly by Struthers Wells Corp. (Warren, Pa.) and Scientific Design Co. (New York), boasts an improved crystal-growing technique that reportedly simplifies the tricky separation of pure ice from the brine.

This is the fifth freezing method to enter the competition in a field dominated by older, established evaporation processes. The others:

• Carrier Corp.'s flash-freezing, in which refrigeration is produced by flashing off a portion of the water (*CW, Jan. 17, '59, p. 39*).

• Blaw-Knox's flash-freezing, using a technique devised by Cornell University's H. F. Wiegandt for providing refrigeration by the flash evaporization of an immiscible hydrocarbon solvent in contact with the sea water.

• Fairbanks, Morse & Co.'s Zarchin process, employing vacuum-vaporization of part of the raw water to refrigerate the remainder. F-M will start construction of a 500,000-gal./day plant in Israel this year.

• Battelle's zone-freezing, which exploits differences in solubility of salt in water and in ice.

Although it's generally conceded that a freeze-process desalting plant will require a larger capital investment than a distillation facility of equal capacity, proponents of the freezing methods point to inherent advantages in the efficiency of the refrigeration cycle. The methods are expected to yield lower operating costs. No single process has a very decisive edge over the others, however, since any installation would have to be selected to fit a variety of conditions peculiar to a given site.

Freeze Demonstration: Although SW-SD's new process was developed under OSW sponsorship, it's not in the running for the selection of a demonstration plant expected in September or October. Latest word from Washington is that either the Carrier or the Cornell process—or a combination of the two—will be picked for OSW's fifth demonstration project at an East Coast site.

The government's program, how-

ever, doesn't limit the number of demonstration plants; SW-SD hopes to get the nod for a future project.

The experimental unit is a 30-gal./-day bench model, developed under two OSW grants totaling $50,000. The unit has been in operation for about four months, has shown enough promise to justify construction of a larger pilot installation.

The next logical step: a pilot plant of about 15,000-gal./day capacity. SD is currently working on the engineering design of a larger unit and plans will be submitted to OSW July 1. If these plans are acceptable the company may get another appropriation of about $300,000 to continue its developmental program. Although the company doesn't anticipate reaching the commercial stage for another two years, SW President Harry Conarro says the next step beyond the pilot plant would be a 1-million-gal./day plant for full-scale fresh-water production.

Crystallization Key: The chief difference between the SW-SD process and other freezing routes is the size of the ice crystals it produces. Most freezing operations produce small ice crystals (about 0.1 mm. in diameter), which are difficult to separate from the resulting slush of ice and brine. SW-SD's controlled crystal-growing technique, on the other hand, reportedly yields crystals of about 1 mm. diameter (about the size of coarse rock salt, says Conarro). As a result the draining and washing of the pure ice is simplified.

Details of the process haven't been revealed, but patent applications on the new method were filed over a year ago. It's a combination of SW's extensive background of crystallization experience teamed with some efficiency-boosting engineering tricks devised by SD.

Essentially the process involves the evaporation of butane or another hydrocarbon in direct contact with the sea water. Control of the crystal growth is maintained by varying evaporation conditions, such as pressure, rate of flow through the crystallizer and the depth of liquid through which the hydrocarbon is bubbled. (The Cornell process also employs a hydrocarbon in contact with the brine, but produces cooling by flashing it off from the mixture.)

Competing Methods: Of the non-freezing routes being explored by OSW (*see chart, p. 85*), the long-tube, vertical, multiple-effect evaporation selected for the Freeport, Tex., demonstration site (*CW Technology Newsletter, July 25, '59, p. 79*) is the closest to realization. By a working agreement between the Interior Dept. and Dow Chemical's Texas Division, this unit is to be built on a five-acre site adjacent to the Dow plant, which will also supply steam to the unit and take the concentrated brine and the fresh water. The awarding of a construction contract for the plant to either Chicago Bridge & Iron Corp. (New York) or Rust Engineering Co. (Birmingham, Ala.) is expected as soon as adjustments in the contractors' bids have been completed by government engineers.

W. L. Badger Associates, Inc. (Ann Arbor, Mich.), designer of the Freeport process, last week reported the formation of Seawater Conversion Corp. to design, engineer and build desalting plants the world over. The new firm is owned jointly by Badger and Kaighin & Hughes, Inc. (Toledo).

Plans for a nuclear-heated multiple-effect flash-distillation process engineered by The Fluor Corp. are also well advanced. But its location is still undecided, since plans to put it at Point Loma (on San Diego Bay) were vetoed because of possible conflict with nearby Navy installations. Alternate southern California sites now being considered: Camp Pendleton or Port Hueneme.

Planning for the two projects that will desalt brackish water rather than sea water haven't progressed much beyond site selection. Ionics, Inc. (Cambridge, Mass.), which has supplied large-scale equipment for desalting facilities on the Persian Gulf and which holds a strong basic patent position, is considered the likeliest firm to engineer the Webster, S.D., demonstration plant. But the vapor-compression, forced-circulation project slated for Roswell, N.M., is considered fair game for any of several companies —including Griscom-Russell, Cleaver-Brooks, Bethlehem Steel, Mechanical Equipment and Whiting Corp.

Pursuit Assured: From all indications, OSW's push for practical, commercial desalting processes will be stepped up to an even faster pace. Most recent official recognition of the program's importance is a Senate bill (S. 3557) giving OSW blanket authorization to ask for whatever funds it wants. The agency now has a ceiling of $10 million, at the rate of $1.3 million/year. The proposed blanket authority will place OSW's requests for funds in the hands of the Appropriations Committee for each year's budget.

This legislative move seems fair assurance that OSW Director A. L. Miller will get the backing he needs to promote the government-private industry cooperation required to make water desalting technically and economically feasible.

New Antipolio Punch

Purivax, a faster-acting Salk-type polio vaccine made via a new purification process, was unveiled by Merck Sharp & Dohme recently at the California Pharmaceutical Assn.'s convention in Fresno, Calif. The process, designed to yield products of higher, more-uniform purity, is said to produce immunity after two doses in a two-month period, instead of the eight-month span required for three to four doses of the regular Salk vaccine.

The new process, according to C. P. Hegarty, director of biological development and control at MS&D, is the result of a five-year research and development effort.

The need for a better vaccine was indicated during the field trials of the original Salk vaccines, which showed a considerable difference in potency from lot to lot. MS&D researchers set out to develop a vaccine with several better properties:

- Higher, more-uniform potency to permit a known quantity of polio antigen in a smaller dose (0.5 cc.).
- Ability to produce immunity after the first two doses.
- Freedom from the monkey kidney antigen often contained in the regular commercial vaccine.

Purification Route: One approach that would accomplish all of these objectives, the researchers decided, was to find a way to make a concentrated vaccine from the purified extract of the polio virus, after its growth on monkey kidney cells. The improvement came when MS&D's Jesse Charney devised such a process adaptable to large-scale operation. Key: precipitation of the virus by

nucleic acid at low pH. Here's how it is used to make the high-purity material:

Production begins with the conventional growing of polio virus in monkey kidney cell medium. After incubation the crude tissue-culture virus fluid is filtered through bacteriaproof filters.

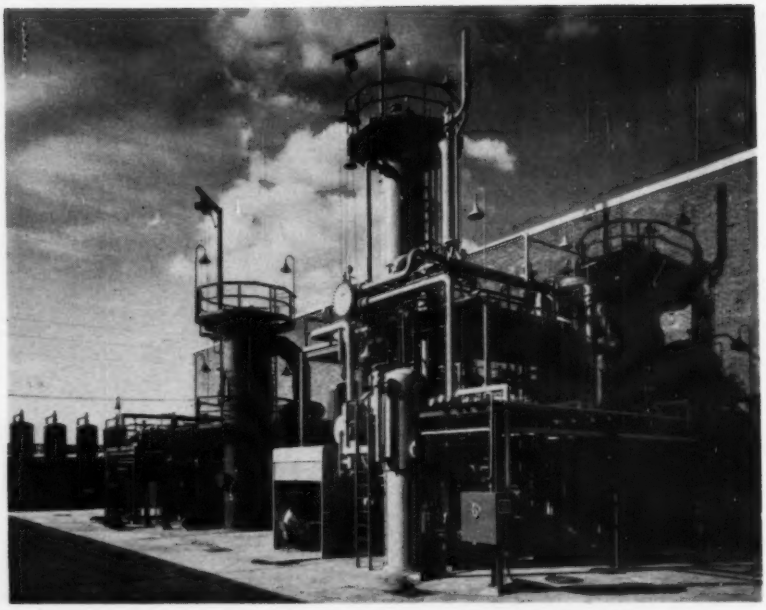
The new purification technique begins with the addition of nucleic acid, which causes the virus to precipitate. This step is followed by enzymatic digestion with desoxyribonuclease and ribonuclease. A salt precipitation step follows to further remove impurities, after which the virus is centrifuged at 30,000 rpm. for five hours. Finally, it is resuspended in buffered salt solution and clarified by low-speed centrifugation.

Vaccine for clinical trial was prepared by inactivating the purified virus (at a concentration of 100 mcg./-ml.) with formalin at 1:4,000 for a 10-day period. The formulated vaccine was preserved with benzethonium chloride at 1:40,000 and neomycin (50 mcg./ml.) in a water-clear solution. Stability studies later proved the value of using 0.05% of a surface-active agent (Tween 80) to prevent the highly purified virus from being physically adsorbed to the surface of glass containers.

Despite a slight loss through adsorption, the first test lot of the purified vaccine had four to five times the desired potency and 10-15 times the required minimum. No demonstrable monkey kidney antigen could be shown, although the crude fluids ranged from 1 to 10 CF units. Virus nitrogen content of the purified product ranged from 89 to 100%, compared with only 1.3-2.5% for the crude fluid.

Commercial Plans: Clinical information gives convincing evidence, says Hegarty, that Purivax can provide effective immunization in more than 90% of recipients after only two doses within a two-month period. Also, because the amount of antigen can be precisely controlled, a more potent vaccine, capable of providing nearly 100% immunity, is hoped for.

MS&D has applied to the National Institutes of Health for a license to manufacture Purivax, hopes to make limited quantities available for distribution before this summer's polio season.



Fractionation Research's pilot unit at Alhambra produces . . .

Data to Trim Tower Designs

The life of Fractionation Research, Inc., has been extended for the second time, this time until '63. FRI, a short-term industry-wide cooperative effort in engineering studies of distillation, has in eight years built up a collection of data that saves the process industries an estimated $9 million/year—on an annual budget of little more than $250,000. And the hint of a new project—possibly responsible for FRI's new lease on life—may lead to additional savings of $7-8 million.

In its new projects, FRI will continue a probe of engineering know-how that began with its formation in April '52 by a group of 42 engineering, chemical and oil companies. Its objective then, as now: improving distillation tower design—a $40-45-million/year item in the companies' capital expenditures bill.

Financing and data distribution will remain on the same basis—each participating company shares expenses, and all receive complete reports of FRI's findings. The original 42 companies, however, have been joined in recent years by 16 licensees who share in total costs from the beginning and are given access to the accumulated data.

The significance of these extra years FRI is to run lies in its new scope. Originally set up to provide better data for existing tower design concepts; its scope of applications continued to broaden with each completed project and now industry sources hint it will pursue a novel approach to tower calculations—"dynamic design."

Details of exactly what this means are hard to come by, since member firms are reluctant to let their hard-won know-how become public. But trade experts describe dynamic design like this: it means designing distillation towers, with time as a variable function, as is actually the case during continuous operation. Vapor-liquid loadings vary as much as 10 to one throughout the vertical height of a single distillation tower; frequently this unbalance poses difficult design problems.

In the past, chemical engineers have tried to tailor each section of the tower to the loadings they calculate at that section. In contrast, dynamic design would consider the tower as a single unit and examine what happens in adjacent sections as one section becomes overloaded.

Some experts estimate there is an additional 20-30% capacity hidden in this technique—capacity that could be translated into another $7-8-million

WHY

YOUR IDEAL SOURCE OF BASIC NITROGEN IS

DU PONT METHYLAMINES

3 strategic shipping points to assure you of prompt delivery—low inventory with Du Pont Methylamines

- **CARNEY'S POINT, N.J.**
  Mono-, di- and trimethylamines
- **CLEVELAND, OHIO**
  Dimethylamine
- **STRANG, TEXAS**
  Mono-, di- and trimethylamines

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

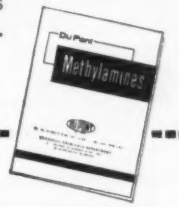
High-purity Du Pont methylamines minimize undesirable side reactions . . . are low in cost, very soluble in water. Each type is available as a compressed anhydrous gas in a lightweight cylinder or tank car, or as an aqueous solution in drum or tank car.

You can use Du Pont methylamines in the manufacture of:

Animal nutrients	Insecticides	Rubber chemicals
Drugs, pharmaceuticals	Ion exchange resins	Rocket fuel
Dyes	Leather	Surface active agents
Fungicides	Photographic developers	Quaternary ammonium salts
Herbicides	Solvents	

Du Pont methylamines are members of a family of Du Pont amines and amine derivatives, which also includes diethylamine, dimethylformamide (DMF), dimethylacetamide (DMAC).

SEND FOR THIS INFORMATION BULLETIN which reviews properties and chemical reactions obtainable with Du Pont mono-, di- and trimethylamines. It also discusses uses and lists references for further study by development personnel. Mail coupon below for your copy.



E. I. du Pont de Nemours & Co. (Inc.)
Industrial and Biochemicals Department
Room N-2533-CW, Wilmington 98, Delaware

Please send me your bulletin on Du Pont methylamines.

*Name*_____ *Title*_____

*Firm*_____

*Address*_____

*City*_____ *State*_____

industry-wide savings, if FRI can tie down its uncertainties.

New projects will continue to be carried out in a 4-ft.-diameter tower on the property of C. F. Braun engineering company in Alhambra, Calif. This unit can be used to test 10 trays on 2-ft. tray-to-tray spacing.

FRI is keeping its staff: T. B. Hudson (Phillips Petroleum) is president, and G. J. Keller is technical director in charge of a permanent staff of chemical engineers. The team also includes a board of directors, with one representative of each of the 42 stockholding companies, and a seven-man technical committee to plan studies.

The pilot unit has been running almost continuously since it began. More than 80 types of distillation trays have been tested in a program to develop specific design data—not so much on the equilibrium relationships between boiling liquids and their vapors as on the tower tray hydraulics of vapor-liquid mixing. Vapor-liquid equilibrium can be tested in small-scale laboratory apparatus; but to be worthwhile, tray hydraulics must be studied on full-scale distillation towers. Since finding tray limits requires overloading, only full-scale towers with extra-large accessories to recycle large volumes of liquid (on the order of 8,000 gal./minute) are of any real value.

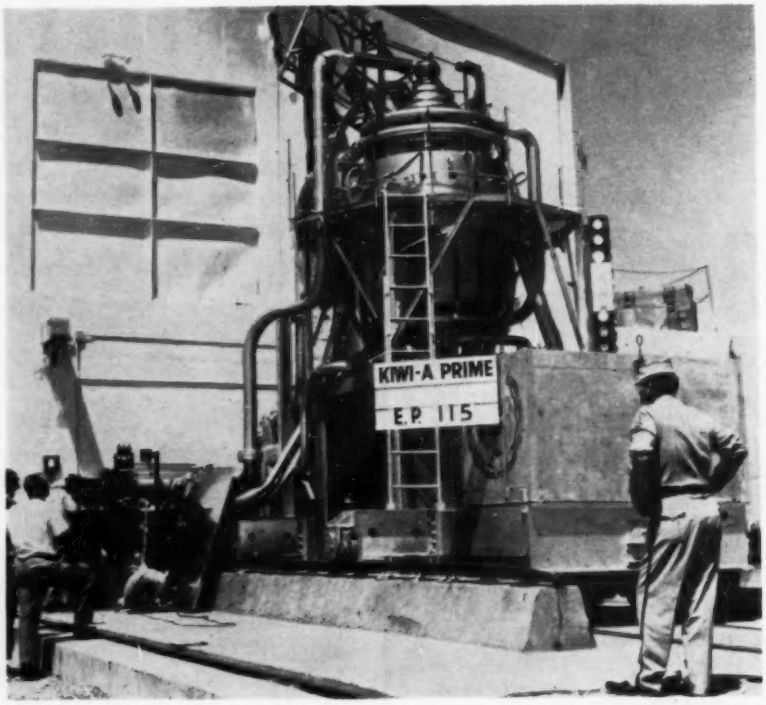
Until FRI was born, very little work had been done with commercial equipment, for companies with such units had found it prohibitively expensive to interrupt plant operations to extract design data. Result: distillation designers worked without essential data, hid their ignorance in overdesign. It was conventional to overdesign 30-40% in '52, when FRI was being set up. Since then, FRI's test data have been distributed in the form of monthly reports and data charts. Member companies are permitted to incorporate this material into their design standards.

The work covers a broad area of experimentation. For example, a wide variety of trays were studied in which liquid mixtures were homologous or whose vapor-liquid equilibrium characteristics were well known. Thus uncertainties would be limited to the hydraulics of tray design. Systems studied to date are n-butane/isobutane, n-heptane/cyclohexane, isopropanol/water, *o* - xylene/*p* - xylene, carbon tetrachloride/propylene dichloride, n-pentane/absorption oil, and water. It has been the results of these tests that have yielded the estimated savings of 30-40% in present-day tower design.

Since FRI's only product is data—much of it not patentable—all of the member companies have been reluctant to discuss details of the reports. Keller, however, points out two general conclusions: (1) extensive tests have shown that perforated trays are as good as bubble-cap trays in many services where they were previously believed unreliable; (2) there is no general-purpose tray that serves satisfactorily in all operations.

Extensive studies proved perforated trays for details such as hole area and hole size, weirs, seal pans, tray spacing, desk thickness, and blanking. These tests showed that this type of tray has an efficiency as high as any, that it performs satisfactorily in fouling service, and that it has a turndown ratio as high as four to one. Bubble-cap tray studies probed cap spacing, seal pans, tray spacing, cap diameter, slot heights, weir heights, and downcomer area. These trays usually operate better with caps submerged.

Despite new studies that crop up, Keller expects that FRI's life must eventually come to an end. It is designed for applied research in a specific, narrow field and must reach a point of diminishing returns, where it will no longer be economical to continue the studies. Thus FRI's success will eventually spell its own doom.



Flightless Reactor Aims at Space

Like the flightless bird for which it's named, the Kiwi A-Prime reactor won't get off the ground. But its test run-up next month at the AEC test site near Mercury, Nev., will bring nuclear-powered rockets one step closer to realization. In operation, nuclear rocket engines will produce thrust by heating hydrogen and expelling it at high velocity. Air Products, Inc., prime contractor to AEC, is currently working on a liquid hydrogen system scheduled for advanced testing next year. Nuclear heating of liquid hydrogen is expected to yield about double the thrust that can be produced by burning this fuel with liquid oxygen.

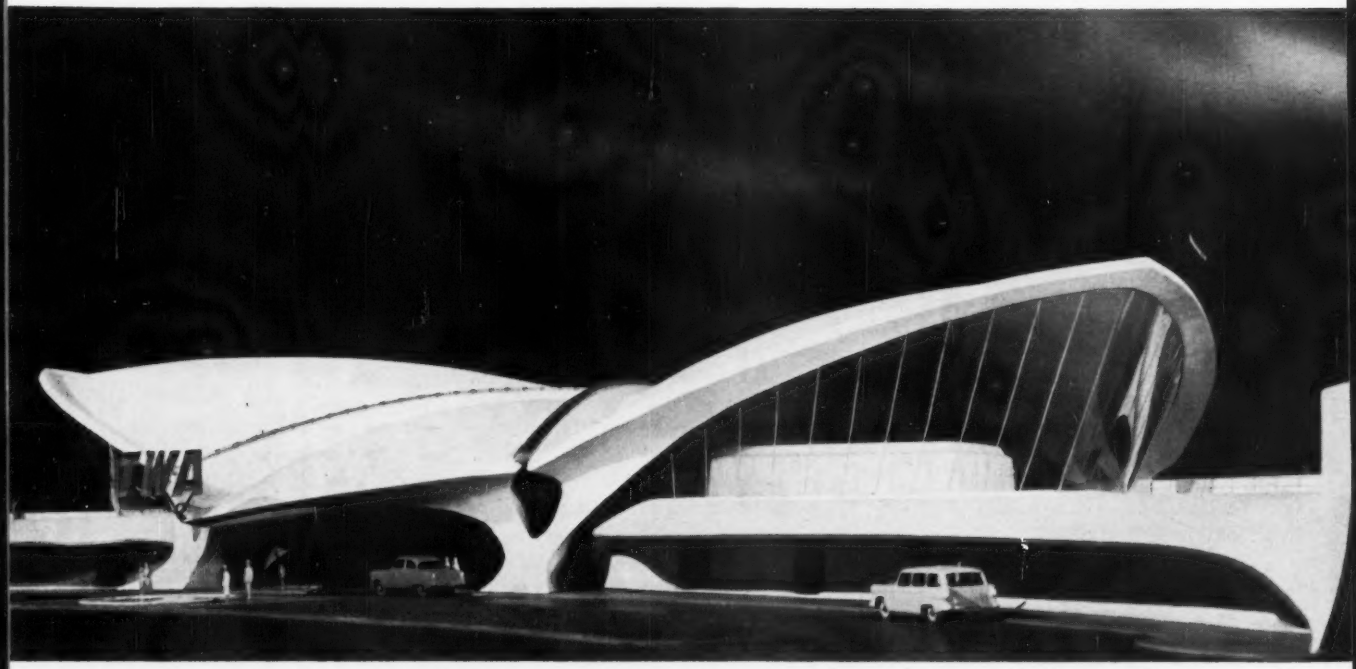
QUALITY TALL OIL FOR THOUSANDS OF INDUSTRIAL FORMULATIONS

Tall Oil and its derivatives are vital in a multitude of formulations to hundreds of industries. For their supplies of these essential materials, industrial leaders turn to Arizona. They know they can rely on the uniformity of Arizona's quality tall oil products. Uniformity that saves time and money, eliminates formulation adjustment, keeps processes constant, product quality consistent. They also rely on the swift dependability of Arizona service. Discover how you can benefit from Arizona quality, uniformity and service. Call Arizona next time you need tall oil.

ARIZONA
CHEMICAL COMPANY
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

DISTRIBUTORS: A. J. Lynch & Company, Los Angeles, Alameda • Charles Albert Smith Ltd., Toronto, Montreal, Vancouver • T. G. Cooper & Company, Inc., Philadelphia • Farac Oil and Chemical Company, Chicago • George E. Moser & Son, Inc., Detroit • Donald McKay Smith Company, Cleveland • Thompson-Hayward Chemical Company, Houston and New Orleans • Van Waters & Rogers, Inc., Dallas • N. S. Wilson & Sons, Boston • M. J. Daly Company, Ludlow, Ky. • Great Western Chemical Company, Seattle, Spokane, and Portland (Oregon) • Welch, Holme & Clark Company, Inc., New York • Whitaker Oil Co., Atlanta, Georgia

ACINTOL® Products:
ACINTOL D and ACINTOL DLR Special Distilled Tall Oil • ACINTOL FA 1, FA 1 Special and FA 2 Tall Oil Fatty Acids • ACINTOL R Tall Oil Rosin • ACINTOL P Tall Oil Pitch • ACINTENE® Terpenes



Plastic foam panels are key structural components for sweeping roof of new airline terminal.

Plastics-in-Building—CPI Studies New Plan

Plastics marketing men are considering a new sales plan this week that could go a long way toward boosting sales to the hard-to-sell building construction industry. The new plan, now being presented to major U.S. plastics producers by Arthur D. Little, Inc. (Cambridge, Mass.), would cost at least $1.5 million; its key objective would be to increase the use of plastics in major structural applications of houses, on the assumption that other construction markets would follow.

But the ADL proposal—which could make the futuristic-looking structure shown above a commonplace thing—has met with sharp criticism in some quarters. Its reception, typical of those granted many industry-wide development programs, means the ADL program may have tough sledding, despite its many beneficial features.

ADL calls its plan "Plastics in Housing—A Program for Growth," proposes a two-stage attack on the obstacles that so far have stymied most large-volume structural applications of plastics in housing. First step would involve an extensive study of the impediments to broader plastics use in housing. This "reconnaissance" effort would then serve as a guide to the design and building of a prototype house, possibly of radically new design, embodying all kinds of plastic materials in their best applications.

The two-pronged effort, according to ADL, will take three years to complete. To finance it, ADL is currently presenting the details to major plastics raw-material producers, hopes to line up "at least 10, but not more than 15" as sponsors. Cost to each sponsoring firm: $150,000 over the three-year span. ADL has pointed out, however, that the program will not get under way until at least 10 sponsors have been signed.

Although the project is aimed specifically at house construction, ADL believes the effort would likely boost plastics' stake in other construction fields too.

Slow to Yield: There's no doubt that plastics have met with formidable resistance from the building industry. At first glance, plastics' construction record looks good. Last year, for example, nearly 1.3 billion lbs. (including coatings and bonding materials) were consumed by the building industry. And that, according to Monsanto Chemical Co., represents some $300 million in plastics sales—23% of all plastics consumed in '59. But it is perhaps more realistic to note that plastics made up only 2% (by dollar volume) of the huge $15-billion primary construction materials market.

Nevertheless, conservative estimates tab the potential markets for plastics in building construction at more than 10 billion lbs. Key applications: structural or space-defining features such as walls, floors, roofs.

Naturally there are many reasons for plastics' slow growth as a construction material. For one thing regulatory restrictions, such as building codes, fire underwriters requirements and trade union rules, have slowed acceptance of plastic components.

Lending agencies have often refused to go along with potential users

on the grounds that plastics in house construction are relatively new and untested.

Even consumers themselves have reacted negatively toward the prospects of living in plastic homes. Main reason: memories of unfortunate experiences in using plastics in other applications.

But probably the biggest impediment to broader plastics use has been faulty communications between plastics producers and users (*CW, April 23, p. 105*).

Needed—A Task Force: It was because of these problems that ADL has drawn up the outlines for an all-out effort to win new markets for plastics in housing.

Here's how the ADL project shapes up:

First portion of the program encompasses a broad, over-all study of problems in getting plastics—or for that matter any material—accepted for house construction. ADL admits that many companies and industry organizations continue to make studies. ADL says its plans will correlate and supplement rather than duplicate them.

The study will also include marketing considerations, such as trends in materials and components, status of prefabrication methods and costs, and availability of accurate data on markets for plastic components.

The final segment of the study program will be devoted to measuring changing house design concepts in the U.S., learning exactly what kinds of houses Americans want.

The Payoff: As a result of these studies, ADL figures it will be able to come up with a new design that incorporates plastic components and structures. The firm says it's a good bet that such a design might be a far cry from present concepts of housing.

ADL plans to build a prototype house as a means of publicizing it to both the building industry and the public.

Dissenters: Although most plastic producers want to share in the housing market, they're not convinced that ADL's program is the way to get it.

Biggest objection: the cost. Plastics producers are pressing ADL for more specific information on what will be returned for the $150,000 charged each sponsor. And it seems likely that nonsponsors would benefit from the program without paying any of the expenses.

Some companies are questioning, too, whether ADL should have access to company-sponsored development work. It's likely that quite a few companies would object to releasing confidential studies to a group in which competitors are represented. And if enough firms feel this way, it could easily force ADL to repeat the work of others.

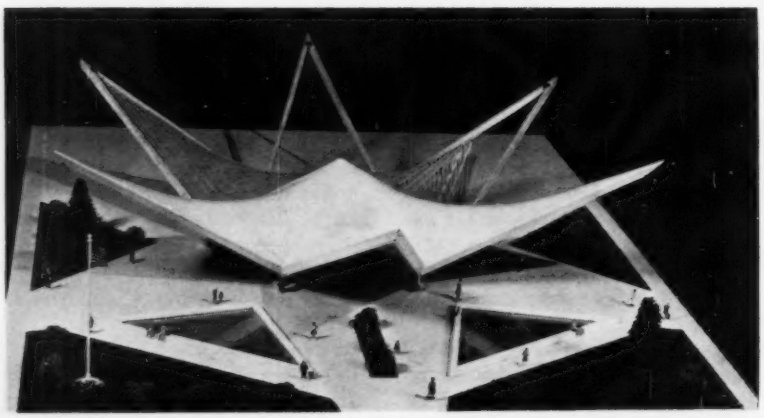
Since many plastic materials are competing for the same markets, some companies are also concerned lest a competitive product get the nod over their own for use in the "dream house."

But the severest critics are those who feel that no broad attack on building industry problems is necessary. They believe the industry has been making too much of the difficulty of using plastics in building. "All you've got to do," say these critics, "is to follow the usual channels and you will have little trouble."

Prospects: It's too early to tell whether Arthur D. Little's program will win industry support. The outcome probably won't be known until next fall. ADL hints that to win necessary sponsorship it may alter the proposed program.

In any case the ADL move spotlights the plastic industries' problems in the construction field, opens to wider debate the means of solving them.

Hyperbolic paraboloid roof is made of concrete over plastic foam.



Coolant Bets on Races

Last week's Indianapolis 500-mile auto race proved a grueling trial not only for cars and drivers but also for Dow Chemical Co.

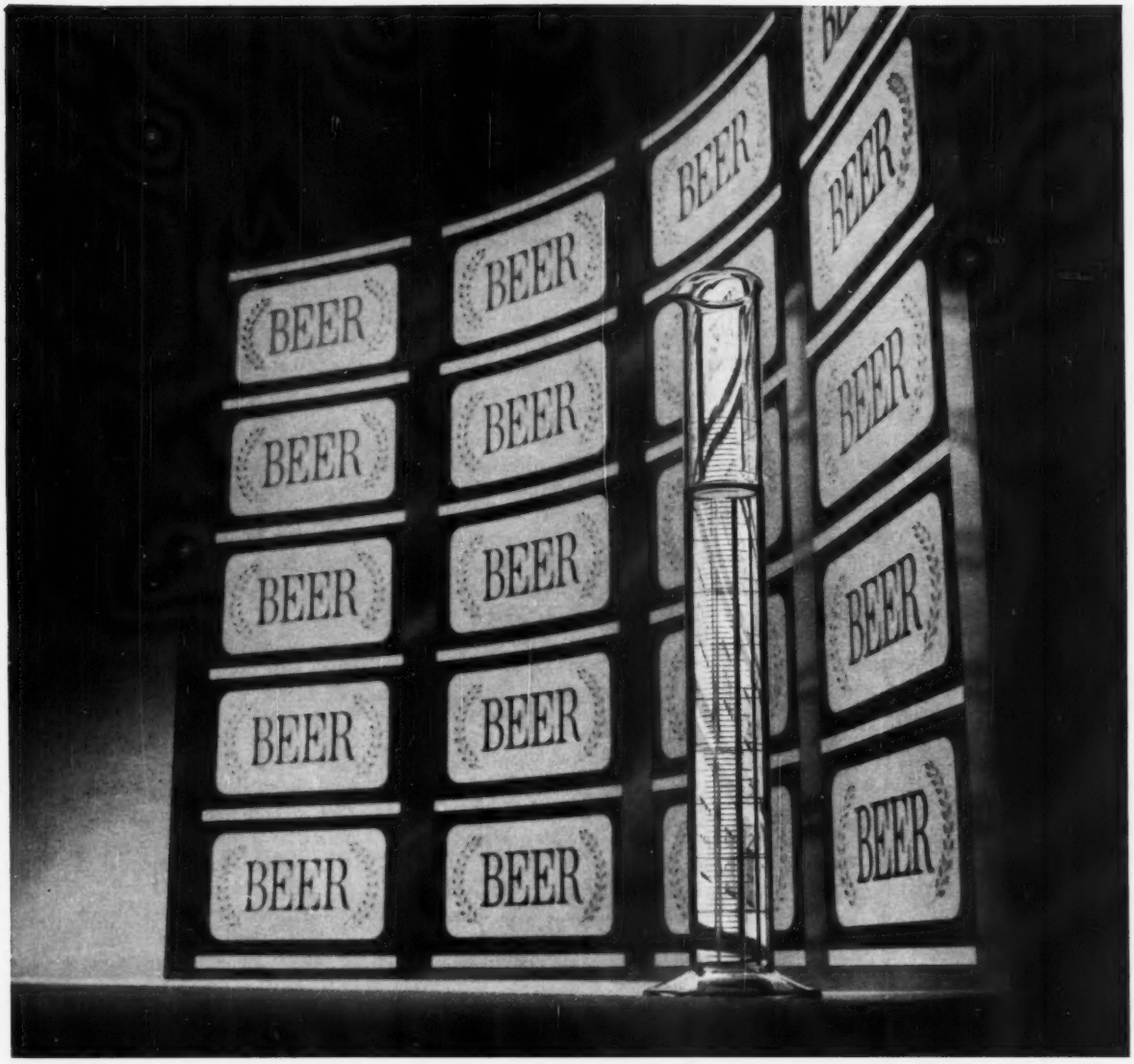
The company had hoped to base ads on a "500" winner who had used its all-weather engine coolant, Dowgard, in his racer. Dow had made agreements with 27 of the 33 drivers to use the fluid, hoped in that way to come up with a Dowgard-using winner. But only eight of the starters finally used Dowgard, and none finished better than sixth.

Nonetheless Dow will continue its racing car promotion program as originally planned. A Dowgard Special (racing car), similar to the one that ran in the "500," will appear under Dow sponsorship in a total of 16 races. Moreover Dow will offer prize money to winning drivers using Dowgard in nine races sponsored by the National Assn. of Stock Car Racing. In the sports car field Dowgard will be the coolant used by the Camoradi U.S.A. team in its schedule of 75 races here and abroad.

Dow will also participate in Colorado's Pike's Peak hill climb, July 4, reputed to be the world's toughest climb.

Demonstrator: Purpose of the program is not to prove the product, says Dow, but to demonstrate Dowgard's performance under the most severe driving conditions. Dowgard may well improve racer performance, because it doesn't boil below 240 F, and may thus reduce the number of race dropouts caused by overheating, a critical racing problem.

Seeking a wider audience for this demonstration the company planned to base two ads on the Indianapolis



Why the use of **UNITOL ACD** in premium quality baking finishes has increased 45% since 1958

The high purity of UNITOL ACD tall oil fatty acids is a big factor in its increasing popularity in baking finish formulations. Its exceptional color retention makes it ideally suited for wet ink overprint varnishes that possess extreme resistance to yellowing on both bake and overbake. This is one reason why more UNITOL ACD is used in these varnishes than any other brand of tall oil fatty acid.

Tests of baked white enamel panels by The Hunter Color Difference Meter showed the color retention of the UNITOL ACD vehicle to be equal or better to comparable cotton seed acid resins and greatly superior to comparable soya acid resins. In addition, a 25% replacement of cocoanut oil with UNITOL ACD resulted in panels with color characteristics essentially equivalent to those formulated with 100% cocoanut oil, while the Sward hardness of the film increased as well.

UNION-CAMP produces a complete range of tall oil products from premium fatty acids to acid refined grades. Write for further information, samples and prices.

unitol

UNION-CAMP

CHEMICAL PRODUCTS DIVISION

Union Bag-Camp Paper Corporation · 233 Broadway N.Y. 7, N.Y.

contest. To hedge against all possible race outcomes Dow's agency had prepared a series of ads using different headlines and copy, all to be part of a newspaper and magazine campaign already in progress.

But trouble at the track forced Dow to substitute standard Dowgard ads for the racing ads. The trouble was due somewhat to confusion. Prior to the race, the 27 drivers seemed ready to use Dowgard, in their cars. But then a rumor spread that the new coolant (it was introduced last March) had evaporated in one of the trial runs. This, plus the fear of losing $110,000 prize money, combined to frighten keyed-up drivers away from Dowgard. The Dowgard Special, driven by veteran driver Tony Bettenhausen, who finished 23rd, was the sole car to qualify using Dow's fluid. Quick work by Dow people was needed to persuade seven other drivers to use Dowgard.

In spite of these trials, Dow feels its all-weather coolant is gaining strong retail dealer support based on its stability under hard racing conditions. As for consumer advertising, Dow's Harry Hardenbrook says, "Talk to us in about two or three races."

Miles Bets on Purity

A novel drug-dating system to indicate the freshness and purity of para-aminosalicylic acid (PAS) is Miles Chemical Co.'s (Elkhart, Ind.) current bet to stem a mounting sales tide of cheaper, imported material. At stake: a $1.5-million market.

Already, several major tableters of PAS have begun to use the plan to fight stiff import competition. And several major U.S. centers of tuberculosis therapy have added "freshness" specifications to their bid requirements. (PAS is used in combination with other drugs in TB treatment.) Another indicator of success: Miles is considering a similar scheme for other products.

How It Works: The Miles plan provides tableters and institutions using bulk quantities of PAS with a written "Certificate of Assay" that states the time of the analytical control tests, results of the tests and the time of shipment. (All shipments are made within 48 hours after the analysis has been performed.) The time factor is important, Miles says, because PAS is degraded with age.

Under the influence of heat, moisture, light and other factors, PAS tends to decarboxylate to *meta*-aminophenol. The latter — itself highly unstable — further degrades to products that have not yet been completely identified. In aging, PAS changes color from white to various shades of tan. More significant, says Miles, is clinical evidence that correlates old, off-color PAS with more frequent—and more serious—side effects in TB patients than those receiving fresh material. Miles also points out that TB patients must take relatively large PAS doses—up to 1 lb./month for many months.

Fighting Imports: The dating plan allows Miles to strike directly at a handicap of some imported PAS. Under ordinary circumstances, several weeks must elapse before foreign-made PAS can reach the U.S. and be distributed. PAS is thus sometimes discolored when used. With dosage forms employing a coated tablet or a colored flavoring agent, it's hard to determine whether the PAS is fresh or not.

Foreign PAS is sold largely on a "price" pitch. Tableters using foreign material can bid for institutional business with prices as low as $2.20 for a 1,000 tablet bottle. With domestic PAS, the tag ranges from $2.50 to $6 or more. This price competition has already forced all domestic producers except Miles to quit the business.

Current generally accepted specifications are of no help to U.S. makers in meeting import competition. They are so broad that they permit a range of coloration and *meta*-aminophenol content.

Official specifications are being reviewed, however. A subcommittee of the USP's Revision Committee is considering new specs that would decrease permissible color and *meta*-aminophenol content. Tighter specs, aimed at reducing side effects of this drug, should help domestic producers.

Miles' assay plan is part of an integrated program to win back the important, 1-million-lbs. annual PAS market. To keep warehousing time to a minimum, Miles is tailoring its PAS production to shipment demand. Production is scheduled at periodic intervals throughout the year rather than for infrequent large runs that would necessitate long storage. Moreover, production is integrated with fast truck shipments that make possible delivery to tableters or users within five days. And the company is employing a packaging device that helps improve stability of the product. Buyers are encouraged to order PAS as needed, rather than take large quantities and store for months.

Rounding out the program: an intensive educational campaign aimed at tableters, institutional buyers and chief pharmacists, and doctors specializing in TB treatment.

This group has already received three mailings of promotional materials. And tableters of Miles' PAS are urged to send out "Certificates of Origin" with filled orders. This certifies that the tablets have been made from Miles material, gives the Certificate of Assay analysis, date and lot number.

To reach doctors and pharmacists, Miles is fortifying the mail program by advertising in scientific journals and exhibitions.

As a final measure, Miles is arranging a detailed clinical study aimed at establishing the role impurities in PAS play in producing undesirable side effects.

Upward Sales Curve: It may be some time before Miles learns how well its marketing plan works. But L. D. Williams, sales manager for Sumner Products, Miles Chemical Co., figures the program has done well so far. Several of the largest municipal centers for TB therapy are now specifying that their institutions buy only domestically manufactured* material. Going one step further, New York City now requires that the time between bulk material manufacture and delivery of tableted material be no more than six weeks.

Several large tableters, adds Williams, have applauded Miles' move, are taking advantage of the plan. One has introduced a "dated package" of its own.

Ultimate outcome of Miles' venture may hinge, in part at least, on the reaction of foreign PAS producers. Countermoves on their part to speed shipments and improve specifications and packaging would, of course, affect the result. But unless that happens, Miles is confident that it stands to regain a big chunk of PAS business.

* This does not necessarily close the door on imported PAS. In some cases, "domestic manufacture" is interpreted to refer only to the tableting process.

PACKAGING ENGINEER. To analyze your bagging requirements, and recommend the right packer from over 50 different models.

FIELD ENGINEER. To install and service packing equipment in the field, and to assist in bag size testing.

THE RIGHT BAG. From 13 bag manufacturing plants located in key areas throughout the country.

Behind each St. Regis® bag

The new St. Regis Bag Division was developed to provide the most complete service ever offered for companies that pack and ship their products by bag. It is so complete it is called *Packaging-in-Depth*—which means, simply, that St. Regis gives you, the bag user, the best bag service available anywhere.

Count on St. Regis for the best bag for your product, the best equipment to fill it, swifter delivery, the most complete engineering staff in the industry, and research and development

BETTER SERVICE. The bags you want, when and where you want them—multiwall, textile and WPPL.

MATERIALS HANDLING. To streamline your packing operation with the latest warehousing techniques and modern auxiliary handling equipment.

PACKAGE DESIGNER. To develop new packages to suit your needs, and discover more advanced, efficient packaging methods.

you buy...Packaging-in-Depth

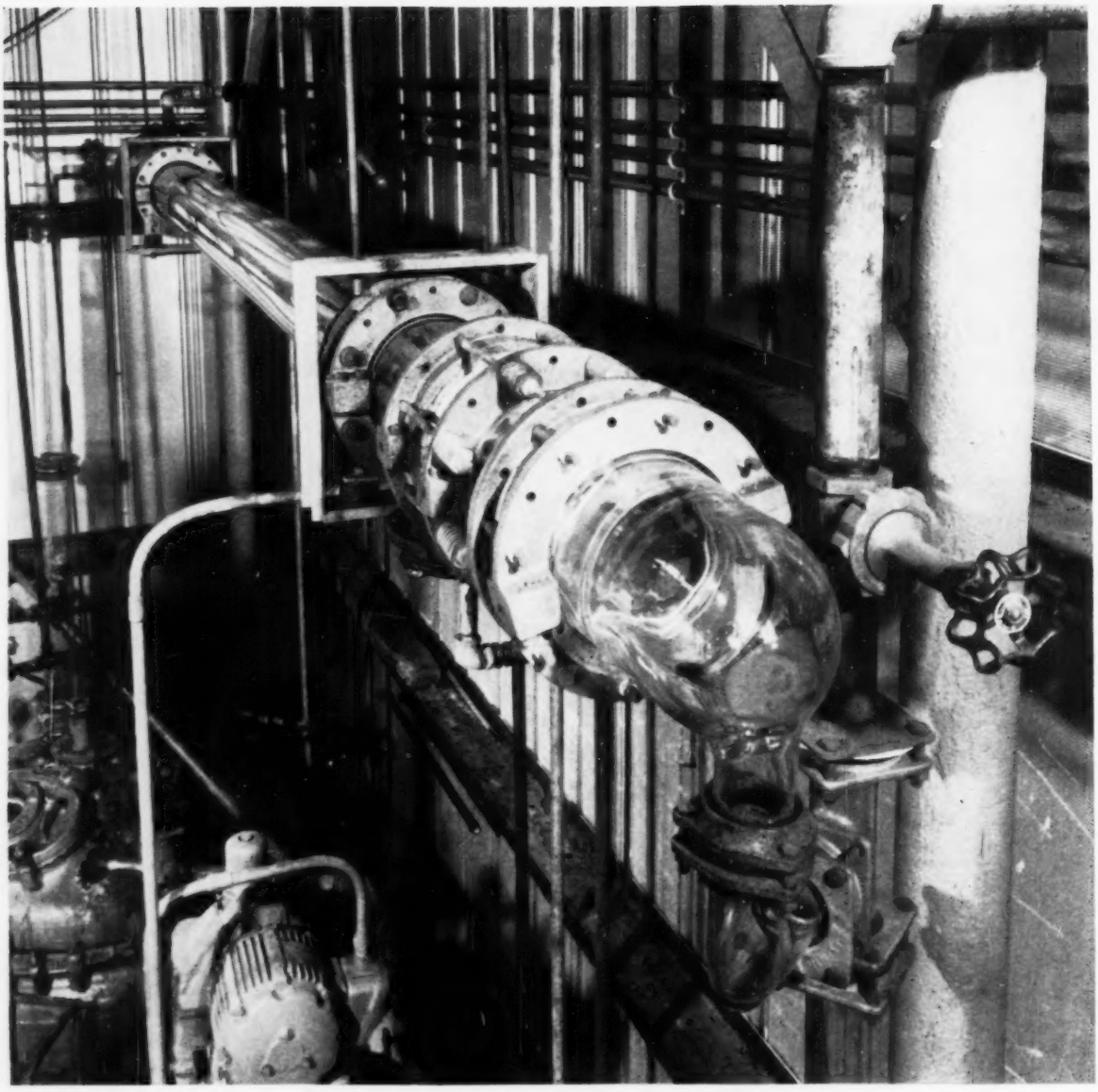
facilities working constantly to improve your packaging.

To sum up: our Bag Division now offers you the most *diversified* packaging service in the country through the most *specialized* people in the industry. Behind each St. Regis bag you buy stands the most complete bag service available . . . *Packaging-in-Depth!*

BAG DIVISION

St.Regis PAPER COMPANY

150 EAST 42ND STREET, NEW YORK 17, N.Y.



PYREX® HEAT EXCHANGER SERVES 2 YEARS WITHOUT MAINTENANCE ON 70% H_2SO_4 at 120°C

That's hot. And corrosive. But not too severe for PYREX® heat exchangers. In fact, just about any chemical at almost any temperature can be run through a PYREX heat exchanger. With no corrosion. With no possibility of metallic pick-up.

This PYREX shell and tube heat exchanger at Hoffman-Taff is used for four different services in the manufacture of vitamins and other preparations for the feed and pharmaceutical industries: slow distillation 70% sulfuric acid decarboxylation where vapor enters at 120°C; distillation of toluene at 100°C; condensation of water solutions of organic acids under vacuum; ethyl acetate distillation.

If *you* use heat exchangers, you stand to gain a great deal by investigating a PYREX unit. Corning makes shell and tube, jacketed, cascade and candle-type heat exchangers. All of them have established top-notch performance records where corrosion and metallic pick-up are problems. In fact, they've disabused industry of the notion that tubes have to be replaced every few weeks.

Glass compares very favorably with other materials on such factors as heat transfer, first cost and safety. It is by far your best buy on installation and maintenance and as a protection against down time.

If you'd like to weigh the merits of PYREX heat exchangers, we have some bulletins for you. Write to us at 2 Crystal Street, Corning, New York, for PE-33 (Design Manual for PYREX Brand Modular Shell and Tube Heat Exchanger Units).

CORNING GLASS WORKS

CORNING MEANS RESEARCH IN GLASS

Market Newsletter

CHEMICAL WEEK
June 11, 1960

A "continued acute decline" in the price that Jefferson Lake Sulphur gets for its sulfur is attributed by the firm's President Eugene Walet, Jr., mainly to the sale and price policies established by the Sulphur Export Corp.

About 66.5% of the sulfur Jefferson Lake sold in first-quarter '60 was marketed through Sulexo. The price received, says Walet, was about $1.80/ton less than the price received during the same quarter of '59.

Although Jefferson Lake owns an 18% interest in Sulexo (Texas Gulf Sulphur has a 37% interest, Freeport Sulphur 37%, Duval Sulphur and Potash 8%), Walet says it opposed the marketing group's theory that "regardless of price realization it's necessary for Sulexo to maintain sales volume."

Freeport's offshore sulfur mine in the Gulf of Mexico is now in commercial operation. The massive installation pulls sulfur from big deposits—discovered by Humble Oil and Refining—located 2,000 ft. under the bottom of the Gulf.

The plant is the world's third largest Frasch plant, has a pipeline to the shore that can handle 4,500 tons/day of molten sulfur; and an average daily capacity of 5 million gal. of hot water.

Ultimate cost of the project, including facilities on shore, is $30 million. Net profits after taxes will be split in half between Freeport and Humble.

•

Quebec Lithium Corp. will complete construction of its new refining plant in July. The unit—located at the mine site near Val d'Or, Que.—cost more than a million dollars, will turn out 6 million lbs./year of lithium carbonate. It's the only plant of its kind in Canada.

Completion of the plant will greatly strengthen Quebec Lithium's competitive position, which previously was weak because sales were limited to only one U.S. customer.

Last year Quebec's deal to sell ore to Lithium Corp. of America ran into a snag when, according to Quebec, Lithium Corp. backed out of the contract deal; the hassle was settled when Lithium Corp. agreed to pay Quebec $1.9 million over a period of three years.

Mine operations—which were temporarily closed down—will also be resumed soon.

•

Ammonium nitrate joins the list of nitrogen fertilizer products that will have lower seasonal price tags; last week Allied Chemical posted revised schedules for anhydrous ammonia, nitrogen solutions (*CW Market Newsletter, June 4*).

"Modest adjustments" of nitrate prices now sent out by Spencer Chemical put ammonium nitrate at $64/ton in August and September, $67 in the last three months of '60, $70 beginning Jan. 1, '61. Prices are for 80- and 100-lb. bags; 50-lb. bags carry a $1.50/ton premium. Low off-season price last year was $63/ton. The smaller discounts this year, compared with '59, are attributed to higher raw-material, transportation, labor and warehousing costs.

Purchasers may also obtain a $1/ton additional savings by buying in lots of 50-ton carloads in delivered zone areas. The new price list also includes a 1% discount on invoices paid within 15 days.

•

Price of sodium lauryl ether sulfate is reduced 3¢/lb. across the board by American Alcolac. New tabs: tankwagon quantities, 19½¢/-lb.; truckloads, drums, 20½¢; single drums, 21½¢/lb.

Reason for the price cut—first since Alcolac started making the chemical about four years ago—is to broaden markets. The ether sulfate now goes mainly into formulation of detergent products such as shampoos, in which it competes primarily with sodium lauryl sulfate.

•

Shell will be a large-scale producer of polystyrene, says that commercial quantities of both general-purpose and high-impact polystyrene are now available from a plant leased from American Cyanamid at Wallingford, Conn. Best guesses put capacity at about 40 million lbs./year. Shell reports it is using Shell-developed processes and company-produced raw materials.

Small-scale production began last fall (*CW Business Newsletter, Sept. 26, '59*). Tradename for the new line is expected to be disclosed soon.

•

Two more oxoalcohols are being considered for comercialization by Enjay. Hexyl alcohol, which is now in semicommercial production, is expected to get the nod first, while hexadecyl alcohol (a C-16 compound) is awaiting further evaluation.

Estimated market for the hexyl alcohol is at least 5 million lbs. Although market potential of the C-16 alcohol is not known, it is expected to be similar to that of the hexyl alcohol.

SELECTED PRICE CHANGES—WEEK ENDING JUNE 6, 1960

	Change	New Price
UP		
Tung oil, tanks, imported, N.Y., lb.	$0.0025	$0.225
DOWN		
Coconut oil, crude, tanks, N.Y., lb.	$0.00375	$0.16
Tallow, inedible, fancy, bleachable, tanks, lb.	0.00125	0.05875

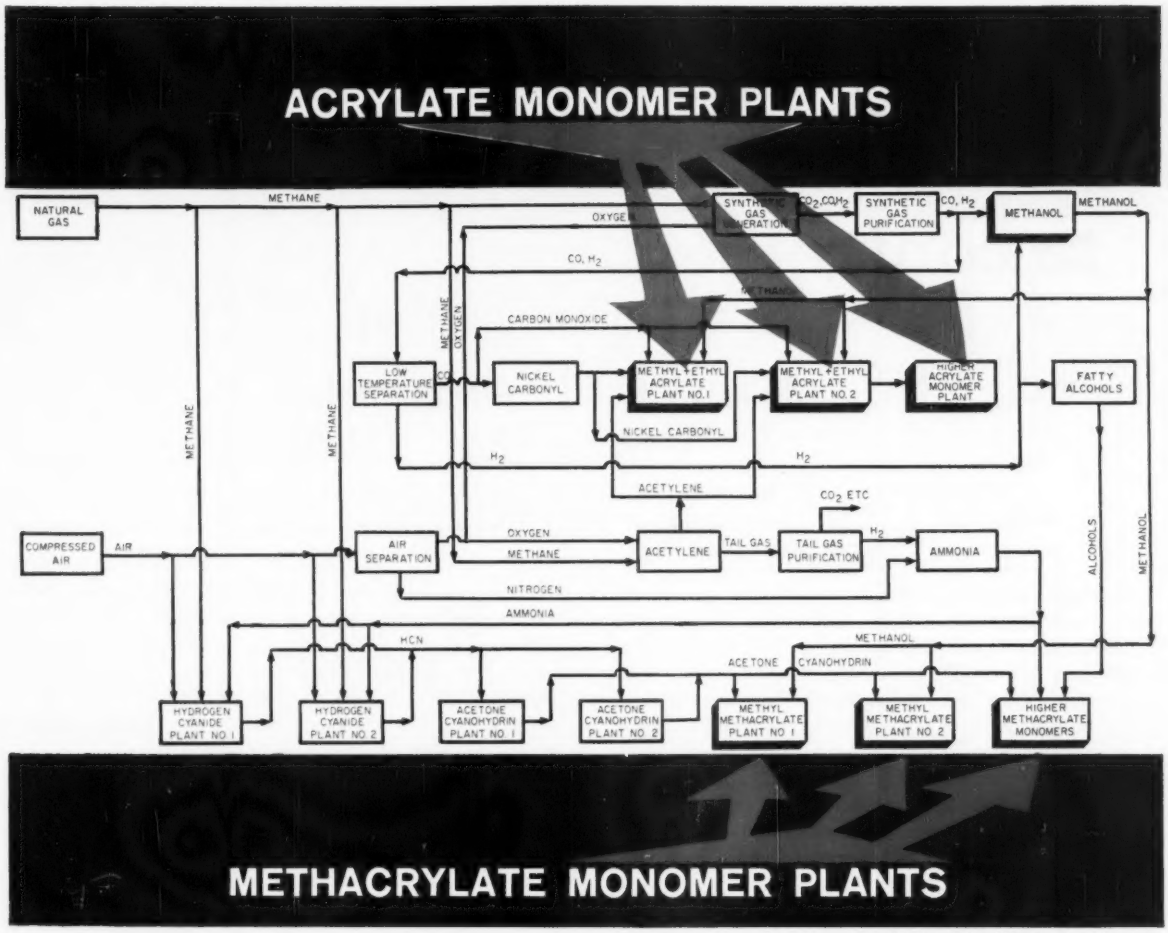


Diagram courtesy of Industrial and Engineering Chemistry.

ACRYLIC MONOMERS

customers benefit from Rohm & Haas plant integration

The above diagram conveys two important messages: (1) it gives the processes used by Rohm & Haas for making acrylic monomers at the Deer Park Plant at Houston, Texas. From basic raw materials—air and natural gas—the intermediates carbon monoxide, methanol, nickel carbonyl, ammonia, HCN, and acetylene are made. These in turn are used at appropriate points for the production of acrylate and methacrylate esters. And (2) it shows the integrated plant system that has made it possible for Rohm & Haas to produce acrylics more economically and to pass on many benefits to customers—price reductions, the widest range of acrylates and methacrylates available commercially from any one source, dependable monomer supply (note that there are two complete and separate units for making HCN, acetone cyanohydrin, methyl and ethyl acrylate, methyl methacrylate).

In addition to these advantages, Rohm & Haas offers customers valuable technical service on storage and handling of acrylic monomers, and a working library of literature designed to help technical men in research, engineering, and production capacities.

For a complete story on acrylics—history, chemistry, development, engineering, current production methods—write to Dept. SP-4 for a reprint of a recent I/EC article. We will also be glad to send monomer samples and technical literature.

Chemicals for Industry

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Industry uses Eastman Antioxidants to control rancidity gum formation embrittlement discoloration decomposition acid formation polymerization

Oxidative deterioration of organic compounds is a complex phenomenon which takes its toll in a variety of ways. Waxes, fats and fat-containing foods turn rancid, gums form in petroleum products, rubber and plastics become embrittled, acid numbers climb in certain aldehydes and alcohols. Many oxygen-sensitive materials can be effectively stabilized, however, through the intelligent use of antioxidants.

How antioxidants function can best be understood by examining the mechanism of autoxidation. One theory holds that autoxidation is a series of chain reactions initiated by an excited or high-energy electron breaking away from an unsaturated hydrocarbon molecule, taking a proton along with it. In effect, this is equivalent to the loss of a hydrogen atom, thus forming a hydrocarbon free radical. If any oxygen is present, the free radical instantly combines with it to form a peroxide free radical.

At this point, the reaction takes one of two directions.

In the first, the peroxide free radical, seeking a proton, reacts with and removes a hydrogen atom from another molecule of the hydrocarbon compound to form a hydroperoxide. The reaction, however, leaves the second hydrocarbon molecule with an unpaired electron, thus creating a new hydrocarbon free radical. The new hydrocarbon free radical forms a new peroxide free radical to react with and remove the hydrogen atom from a third molecule of the hydrocarbon compound, etc., etc. A self-perpetuating chain reaction results.

The hydroperoxides so formed undergo further reactions resulting in the formation of carbonyl compounds. These reactions are not fully understood but probably involve the oxidative action of the hydroperoxides on the double bonds of the unsaturated hydrocarbon or further oxidation of the hydroperoxides themselves. The carbonyl compounds result in an increase in the acid number of various aldehydes and alcohols, and off-flavor and -odor in fat-containing food products.

In the second type of reaction, the peroxide free radical causes crosslinking and chain scission. In plastics and rubber, these reactions are manifest as film embrittlement and general loss of physical properties. High-molecular-weight compounds are formed in petroleum products by the action of oxygenated free radicals on unsaturated hydrocarbon constituents.

Antioxidants are effective because they preferentially supply the hydrogen atom needed by the hydrocarbon free radical to restore its electron ring structure. When the free radical captures the hydrogen atom, its activity is terminated, and consequently the chain reaction that leads to formation of polymers and carbonyl compounds is checked.

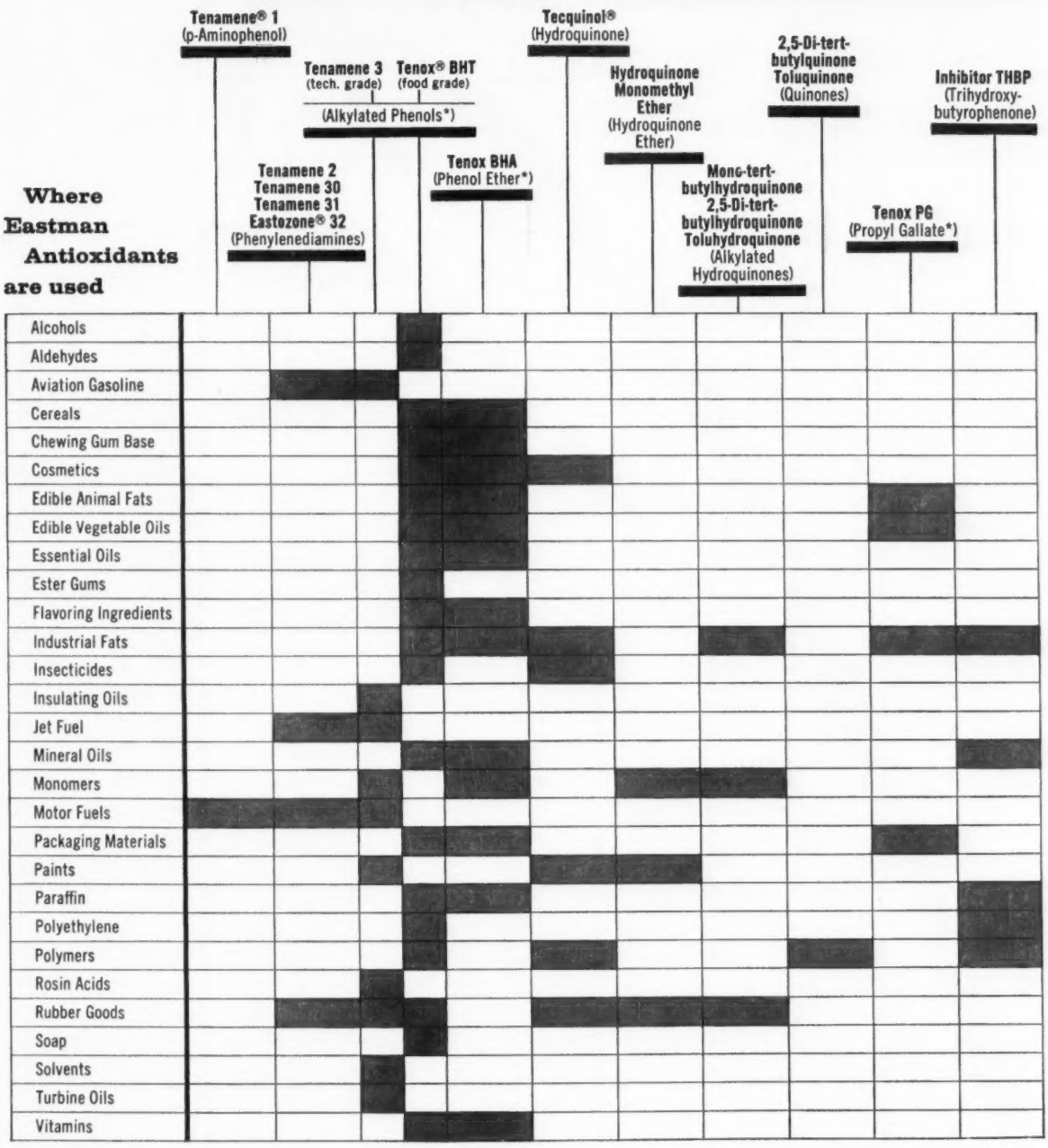
Antioxidants are of three types, classified according to the manner in which they donate hydrogen atoms:

1) Amine type (hydrogen atom comes from the amine group).
   Example: phenylenediamines
2) Phenolic type (hydrogen atom comes from the hydroxyl group).
   Example: alkylated phenol
3) Combination (hydrogen atom comes from both groups).
   Example: p-aminophenol

Eastman antioxidants are performing this function efficiently in the products of many companies, in many different fields. If you have a product that might benefit from protection against oxygen, investigate Eastman antioxidants. Eastman has long experience in this field and maintains fully-equipped laboratories staffed with antioxidant specialists ready to help you evaluate the benefits of using antioxidants in your products. Your inquiry is invited. Write EASTMAN CHEMICAL PRODUCTS, INC., subsidiary of Eastman Kodak Company, KINGSPORT, TENNESSEE.

Eastman Antioxidants

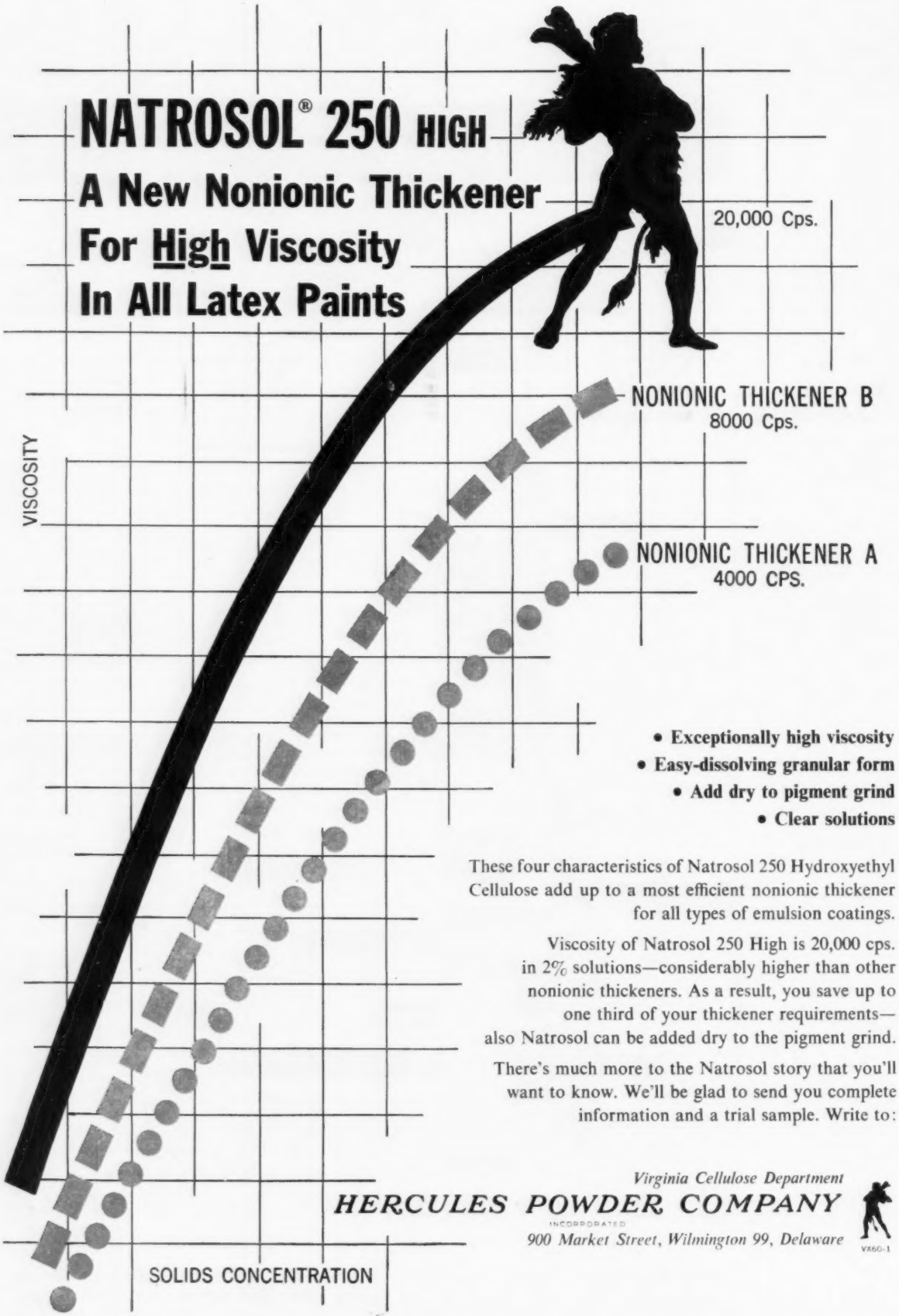
Eastman Antioxidants



*These antioxidants are supplied alone and in many different ratios and combinations to meet specific processing or service requirements: Tenox 2, Tenox 4, Tenox 6, Tenox 7, Tenox R, Tenox S-1.

NATROSOL® 250 HIGH

A New Nonionic Thickener For High Viscosity In All Latex Paints



- **Exceptionally high viscosity**
- **Easy-dissolving granular form**
- **Add dry to pigment grind**
- **Clear solutions**

These four characteristics of Natrosol 250 Hydroxyethyl Cellulose add up to a most efficient nonionic thickener for all types of emulsion coatings.

Viscosity of Natrosol 250 High is 20,000 cps. in 2% solutions—considerably higher than other nonionic thickeners. As a result, you save up to one third of your thickener requirements—also Natrosol can be added dry to the pigment grind.

There's much more to the Natrosol story that you'll want to know. We'll be glad to send you complete information and a trial sample. Write to:

Virginia Cellulose Department

HERCULES POWDER COMPANY

INCORPORATED

900 Market Street, Wilmington 99, Delaware

VX60-1

Corrosion-resistant metallic linings promise lower-cost process piping

Type of lining	*Description*	*Supplier*	*Availability*
Electroplated	Electrolytic deposition of nickel on steel pipe	Huntington Plating, Inc. (Huntington, W. Va.) Bart Manufacturing Corp. (Belleville, N.J.)	Production quantities
Kanigen	Electroless plating of 93% nickel, 7% phosphorus coating from solution	General American Transportation Corp. (Chicago)	Production quantities
Niphos	Electroless plating of 98% nickel, 2% phosphorus coating from paste application, and firing at 2000 F	M. L. Sheldon & Co., Inc. (New York)	Production quantities
Clad	Roll-cladding of stainless steel onto carbon steel, followed by fabrication of the pipe	Lukens Steel Co. (Coatesville, Pa.)	Production quantities
"Strubing"	Hydraulic, pneumatic or mechanical expansion of stainless, alloy or other metal tubing from a flat, ribbonlike form inside a steel pipe	Wolverine Tube Division of Calumet & Hecla, Inc. (Allen Park, Mich.)	"Strubing" available in production quantities; lining is experimental
Expanded	Hydraulic expansion of stainless, alloy and other tubing inside a steel pipe.	Gray Tool Co. (Houston, Tex.)	Production quantities
Forged	Insertion of sleeve inside steel pipe during forging	Phoenix Iron & Steel Co., Tube Division (Phoenixville, Pa.)	Experimental
Nickel coated	Coating of nickel onto steel billet before it is shaped into a mill product	The International Nickel Co. (New York)	Experimental

Inside Attack on Process Piping Costs

It's no coincidence that three companies are this week in the midst of experiments—while Gray Tool has already set up for full-scale production (*CW Technology Newsletter, May 14*)—to line ordinary steel pipe with more expensive, corrosion-resistant metals and alloys. The moves, which could double the number of commercial methods of putting metal linings into process piping (*see table, above*), come at a time when they are most needed to help the chemical industry out of a pipe jam.

In some cases, lining techniques can save over 50% of the cost of heavy-wall alloy piping, provide corrosion protection with no restrictions on pressure service.

Reasons for the interest in lined pipe are obvious. Stainless-steel and alloy piping costs have been rising steadily. The costs of more exotic metals for corrosion resistance (e.g., titanium, zirconium and tantalum) are dropping slowly, but still won't fit the average chemical company's pocketbook. Plastic piping is taking over many process jobs, but it can't always meet the service demands (particularly those of high temperature and pressure); and a lack of standard fittings is an added drawback of plastic piping (*CW, Feb. 20, p. 108*).

Meanwhile, although there's a trend

toward light-wall (Schedule 5 and 10) stainless that can save over 50% of the cost of heavy-wall (Schedule 40 and 80) stainless in many cases, the usefulness of light-wall piping is generally limited to pressures below 150 psi. (*CW, Oct. 25, '58, p. 51*).

Late Stir: Bimetallic tubing isn't new, having been used in heat exchangers for many years. But until recently, little bimetallic tubing was available in heavier-walled process piping; and there were only three types of linings from which to choose.

Stainless-lined pipe, made by cladding techniques has been offered for about 20 years, but only in diameters 24 in. and larger. Welding was the problem. If welded from the outside with carbon-steel welding rod, the weld near the stainless was weak and brittle. In large-diameter pipe, the welder could weld the carbon steel from the outside, then crawl inside to weld the stainless liner with stainless rod.

It wasn't until last year that Lukens Steel developed a method of preventing embrittlement by using low-carbon-steel transition welds between the stainless liner and the outer carbon-steel pipe. This makes smaller diameters of clad pipe attractive—although Lukens says that 4 in. is the minimum diameter at which savings over alloy pipe are worthwhile. These savings: 10-50% in material costs. They can't bring the cost of stainless-clad below that of centrifugally cast stainless pipe. But cast pipe finds biggest use in applications such as soil and waste disposal rather than in processing, which might call for high-pressure service.

Cost Comparison: Plated piping, by electrolytic and electroless methods, has been on the market for a number of years (e.g., the newest, Niphos, has been available for two years). It can more than match clad-pipe savings, particularly in the smaller diameters. For example, General American Transportation's Kanigen electroless-plated pipe (*CW, March 28, '53, p. 50*) generally runs 50-60% below the cost of solid alloy piping. And, according to GATX, the factor that determines whether savings will be worthwhile is usually wall thickness rather than diameter of the pipe (i.e., Kanigen coated, thin-wall tubing for heat exchangers offers little advantage over thin-wall alloy tubing).

Niphos, which like Kanigen is a nickel-phosphorus coating, is competitive for most applications. However, M. L. Sheldon, exclusive sales agent for Niphos, figures cost on the basis of ordinary piping. He says that if ordinary piping costs 50¢/ft., Niphos coated will cost about double. And, Niphos, unlike Kanigen, has garnered some heat-exchanger applications.

Electrolytic nickel coatings* are usually less expensive than electroless coatings. But costs are complicated, depend on complexity, size and value of the pieces plated. For simplest pieces, electrolytic methods will produce coatings for about 20-25% the cost of electroless methods. As complexity of the part increases, the electrolytic costs go up; electroless's don't.

Whether the three new techniques based on inserting alloy sleeves into carbon steel pipe can compete in cost with the established cladding and plating methods remains to be seen. Wolverine Tube is already offering its collapsed metal tubing, called Strubing, for regular piping jobs (*CW, July 25, '59, p. 104*). But it's just lining its first pipe—a 300-ft.-long caustic pipeline at a chemical plant—and is not ready to talk costs. Phoenix Iron & Steel's pipe lining is no further along.

Even Gray Tool, which recently set up for full-scale production, has no set price list ready. But savings over solid alloy pipe will range from a little over 10% for 1-in. Schedule 40 pipe to about 60% for 3-in.

And, International Nickel's technique of nickel coating a steel billet before it is shaped into plate or pipe, is still about a year away from any cost information. Inco won't even discuss process details.

Lining Comparison: Electroplated nickel is usually coated in thicknesses between 0.003 and 0.010 in., dependings on requirements. Kanigen coatings range from 0.003 to 0.005-in. thick; Niphos between 0.0015 and 0.002-in. per coating, with more than one coating possible. GATX and Sheldon both point out that their products are more than a substitute for electroplate, have special properties of high hardness and nonporosity. But they don't overlook the shortcomings.

The Kanigen coating is harder than Niphos, but is nonductile. Kanigen-coated pipe can't be bent without cracking the coating. And, it's higher phosphorus content (7% versus 2%) causes steel embrittlement during welding. Consumable nickel inserts can be used for joining, but higher-cost flanged joints are preferred assembly. Niphos coating doesn't peel back from the weld point; piping can be welded with special stainless weld rod and can be cold bent.

But because it is heated to 2000 F during coating, the metals that can be Niphos coated are limited. And there may be pipe distortion during the firing process. Niphos has a higher melting temperature (about 2100 F) than Kanigen (1650 F) and can be used in higher-temperature service — about 1150 F, compared with 400-500 for Kanigen, which softens at 800 F.

Both Niphos and Kanigen form a ternary alloy (nickel, phosphorus and iron) with the coated pipe. This alloy is believed to be more corrosion resistant than the coating itself. But all coated pipe has one drawback: the coating thickness cannot match that of clad or other pipe with inserted linigs. This may limit its use to applications that involve preventing product contamination, and to those in less severe corrosive atmospheres.

Of the nonplated techniques, Wolverine's Strubing should have the advantage of field fabrication. The alloy tubing, which is rolled flat for shipment, can be drawn through the pipe and expanded hydraulically at the field location. But problems of tearing and scoring of the Strubing during its insertion have to be overcome. And, there are still unanswered questions about welding and fitting around bends in the pipe.

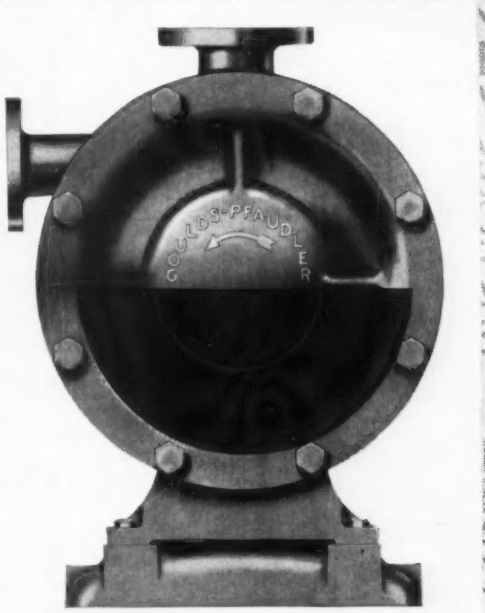
Gray Tool, which lined oil field piping on an experimental basis for five years before its first few chemical plant jobs last year, fits the liner tightly into the pipe, hydrostatically expands it to conform to pipewall irregularities. It, too, must solve the problem of lining elbows.

Phoenix, like Gray, handles the lining operation in the shop. It first pierces and elongates steel billets to form the pipe, then inserts the alloy sleeve, reheats and forges the pipe.

It's apparent that the chemical industry is now getting the ingredients it needs to cut corrosion-resistant piping costs. How well it uses them remains to be seen.

* Coatings can be supplied by any electroplater set up to handle the size of the piece; in piping, Bart Manufacturing and Huntington Plating are considered to be the largest suppliers.

ACETIC ANHYDRIDE ALUMINUM SULP
HATE BORIC ACID CARBON TETRACH
LORIDE CUPRIC CHLORIDE ETHYL AC
ETATE FERRIC NITR
FERROUS SULPHAT
GLUTAMIC ACID IO
THANOL MONOCHL
NOETHANOLAMINE
LPHORIC ACID PHO
LORIDE PHENOL PY
TASSIUM PERMANG
D PYROGALLIC ACI
IUM SULPHATE SOI
PHITE OXALIC ACID
TIC ACID METHANO
TRIETHANOLAMINE
WATER - DISTILLED
MONIUM HYDROXID
OXIDE SODIUM HYI
SODIUM CAR
CHLORITE



SODIUM HYPO
OSPHATE S

PUMP CORROSIVES WITHOUT CORROSION

Every surface that comes in contact with the pumpage is protected by glass fused to metal—in the Goulds-Pfaudler Fig. 3708 glassed centrifugal pump.

This pump can lick your corrosion or contamination problem when pumping corrosives like those listed here (and hundreds more). The tough glass-to-metal bond resists most acids at temperatures up to 350°F and alkalies at moderate temperatures. And, because glass is so smooth, it discourages product adhesion and scale build-up. No loss of product due to contamination, since glass is inert.

Choose from four different sizes and get capacities up to 700 GPM, heads up to 140 ft.

Write for Bulletin 725.2 for details, plus a second booklet, "It's What's Inside That Counts," for the inside story. Address Goulds Pumps, Inc., Dept. CW-60, Seneca Falls, New York.

GOULDS PUMPS

At Dow, many of these valves are salvaged by disabled workers.

Valves Help the Disabled

Finding suitable jobs for temporarily and permanently disabled workers is an ever-present plant problem. But Dow Chemical Co.'s Midland Division has hit on a method to simplify the problem that is paying off for the workers and the company.

Disabled workers who can't be placed in suitable jobs in their own departments are transferred to a special utilities services crew in the steam trap and valve repair shop where they are put to work salvaging small valves. The shop acts as a clearing house. When other departments need workers for jobs such as handyman, clerk, janitor, light packer or labeler, the shop supplies men who aren't restricted to bench work.

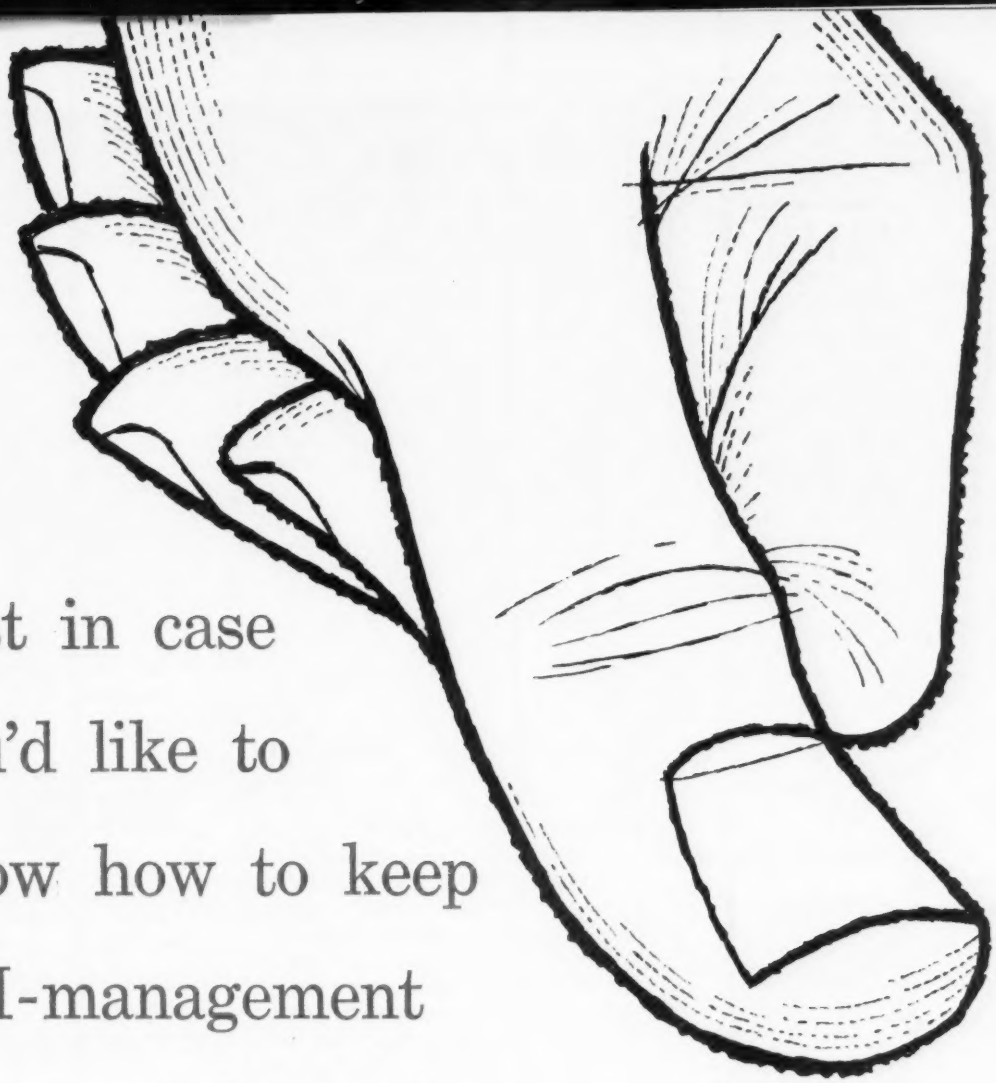
The idea was sparked by a suggestion from Bob Schroeder, of the compensation committee, and Bob Driver, labor relations coordinator for the shops and services department, in '52. They felt that a disabled worker in dire need of employment might be put to work salvaging valves. The plan filled the need of the moment for the worker. But in '58, on the basis of a report by Frank Neering, who replaced Driver as labor relations coordinator, it was revived as a formal program. It was expanded to include other disabled workers, made a part of the union contract.

A placement committee, with representatives from shops and services, personnel, and compensation departments, and the union, helps direct the program with guidance from the medical department. The program is fitted to the employee's need rather than to seniority and other considerations. Periodic medical checks determine when crew members should be transferred to a regular department job, removed from the disabled list.

Few on Valves: Of 39 men who have been in the program, five have gone back to their original departments and eight have been transferred to other regular jobs. Of the 21 men still in the crew, only four are salvaging valves; the others are working as temporary janitors and clerks. One man has been moved into the electrical shop where he is repairing motors.

Ed Wecker, who is superintendent of the shop and the fire department, points out that many of the men out on loan to other departments are so anxious to show that they can do a good day's work, they quickly turn temporary jobs into permanent ones. And, this is one of the keys to the program, because there just aren't enough jobs available that are suitable for the badly disabled workers, Wecker says.

Dow's success with the program shows, as it has at other chemical companies (*CW, Oct. 12, '57, p. 55*), that hiring disabled workers can pay off.



Just in case you'd like to know how to keep CPI-management buyers right under your thumb

SIMPLE AS THIS–Keep your product right in front of them . . . *all year 'round!* How? Put your story where they want it, when they want it . . . in the pages of the 1960-61 BUYERS' GUIDE ISSUE of Chemical Week.

The same buying-powered thousands of CPI-management men who read Chemical Week pay to get the BUYERS' GUIDE. They get it to use it. They use it to find sources for chemicals, manufacturers of equipment and supplies, special services. They keep it where they can reach it. They rely on it *absolutely!* They recognize it's the most complete directory-catalog in the field–the authoritative "sourcebook" from the *spokesman-in-print* for the Chemical Process Industries.

Look at it this way: Your salesmen chase after buyers. Your direct mail and regular business-paper advertisements chase after buyers. But here in the busy BUYERS' GUIDE you sit back, relax, let buyers chase after you. And they do, *willingly.* Just be sure when they catch up with you that you tell them all they want to know. *Wire your space reservation collect.*

CHEMICAL WEEK

BUYERS' GUIDE ISSUE

September 24, 1960
Forms close–June 15.

PRODUCTION EQUIPMENT

Motor Protection: Westinghouse Electric Corp.'s (P. O. Box 2099. Pittsburgh, Pa.) new Guardistor motor is protected from heat buildup in the windings with contactless PTC thermistors. The thermistors are encapsulated in epoxy resin and inserted into the winding to become an integral part of the motor. The thermistors protect against overheating caused by single phasing, rotor locking, too-frequent starting, repeated overloading, high ambient temperatures, abnormal voltage conditions, ventilation failures, switch welding, plugging and reversing. The thermistors are not affected by line currents, are set to give snap-action response at predetermined critical temperature of insulation and enclosure.

•

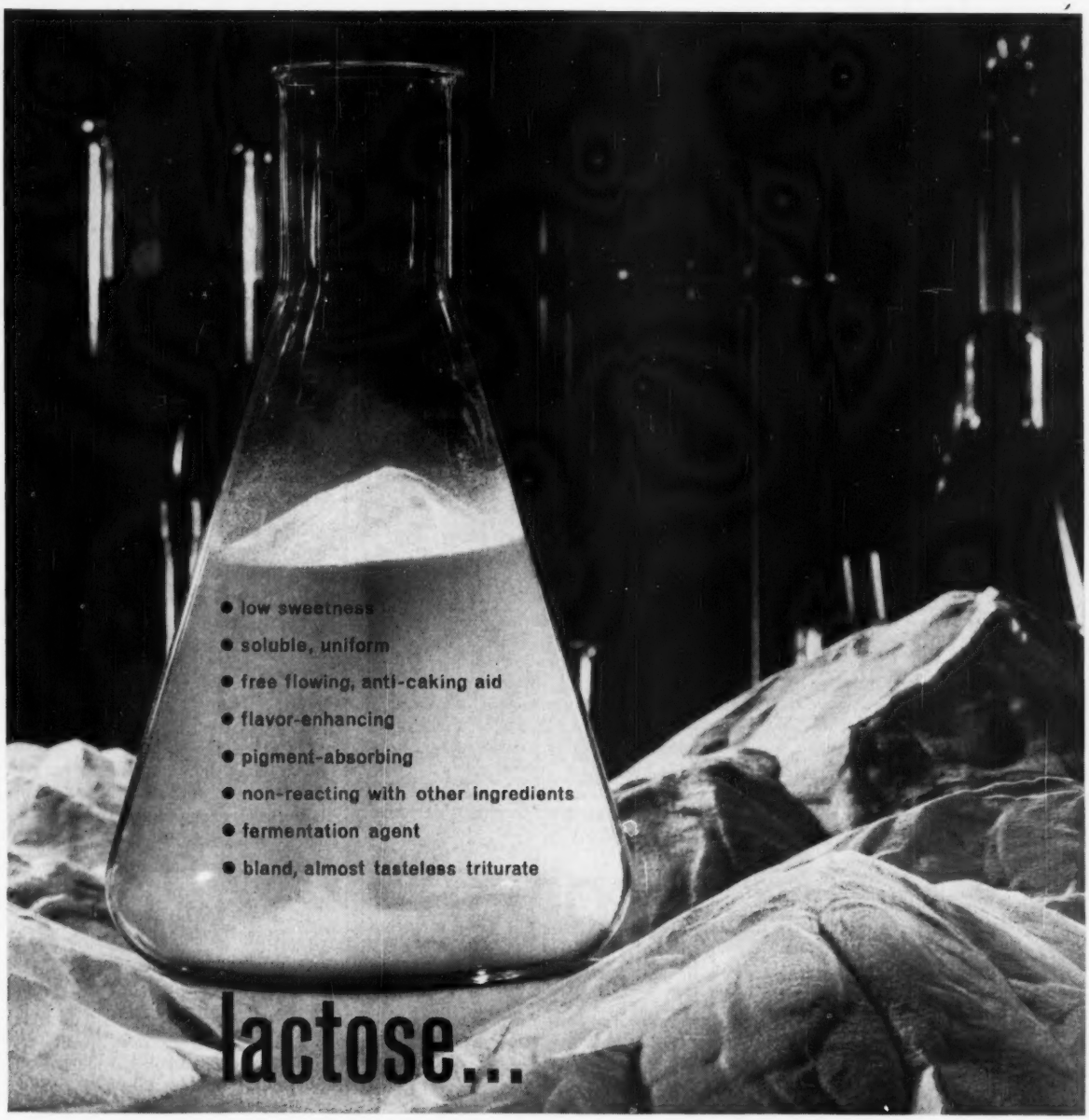
High-Temperature Thermocouple: Englehard Industries, Inc. (75 Austin St., Newark 2, N. J.) is out with a new refractory metal thermocouple combination for measuring temperatures up to 5072 F. The combination, tungsten vs. tungsten-26% rhenium, is recommended for use in vacuum, hydrogen, nitrogen, argon and helium atmospheres. The thermocouple is not recommended for oxidizing and hydrocarbon-vapor atmospheres that will attack the tungsten at temperatures above 1832 F.

•

Silicon Rectifier: A water-cooled, power-conversion silicon rectifier for large electrochemical applications is a new offering of Allis-Chalmers (Milwaukee 1). The rectifier's compact water-to-water heat exchange equipment can be located at any spot in the plant. Cells are mounted on the rectifier's water-cooled bus bars, can be removed without disturbing the cooling system. Alternate systems are available for direct raw-water cooling or for recirculating cooling with a water-to-air heat exchanger.

•

Aluminum-Impregnated Fabrics: Baxter, Kelly & Faust, Inc.'s Safety Fabrics Division ("C" and Tioga Streets, Philadelphia 34) will impregnate any fabric with aluminum using its new process that permits the fabric to retain original strength, design and flexibility. The aluminum protects the fabrics to temperatures up to 2500 F, prevents 96% of the heat from



MOST-VERSATILE SUGAR KNOWN

Lactose is an amazing sugar with unlimited uses. It can improve your present products and help you develop new ones. It can lower your costs, simplify your processing. New uses are being discovered for it every day.

Only Western can supply you with all forms of Lactose—five grades, ten granulations. Strict chemical and bacteriological specifications and a rigid quality control program assure highest quality.

Take a fresh look at the characteristics of Lactose. One of the grades or granulations may help solve a problem you are working on right now. For free samples and information, write our Technical Service, Department 20D. (Tell us the applications you are considering.)

Foremost lactose

WESTERN CONDENSING COMPANY

Appleton, Wisconsin

World's Largest Producer of Lactose-Pure Milk Sugar

Distributed Nationally by Chemical Department, McKESSON & ROBBINS, INC.

penetrating the fabric, according to tests by the United States Testing Co. The finish can be applied to both sides of the fabric.

•

Flow Integrator: Any flow that can be linearly represented by a dc. voltage or current signal in the 0-25 v. range can be integrated with GPE Controls, Inc.'s (240 E. Ontario St., Chicago 11) new Model R 790 electric integrator. Applications include lineal measurement of webs and strips, positive - displacement - fluid motors driving tachometers. Integration accuracy is within 0.5%.

•

Cut-Off Valve: Agavenco Inc. (858 Scott St., Santa Clara, Calif.) is out with a new line of light-weight aluminum valves for flow control and shut-off. The valves have an aspirator system in the by-pass port to reduce down-stream line pressure and permit instantaneous cut-off of liquid flow in applications such as spray drying and sprinkling. Sizes: 1 and 2 in.

•

Hose Clamps: Ideal Corp. (Brooklyn 7, N. Y.) has added seven new sizes to its line of Snaplock hose clamps. The clamps, which can be used to attach filter bags to housings, cover diameters from ½ to 12¼ in.

•

Teflon-Seat Valves: Walworth Co. (750 Third Ave., New York 17) is offering Teflon-inserted seat rings as optional equipment for its line of 150-300-lb. bolted-bonnet steel valves. The Teflon replaces one of the metal seating surfaces of the valve, giving tighter closure than all-metal seals.

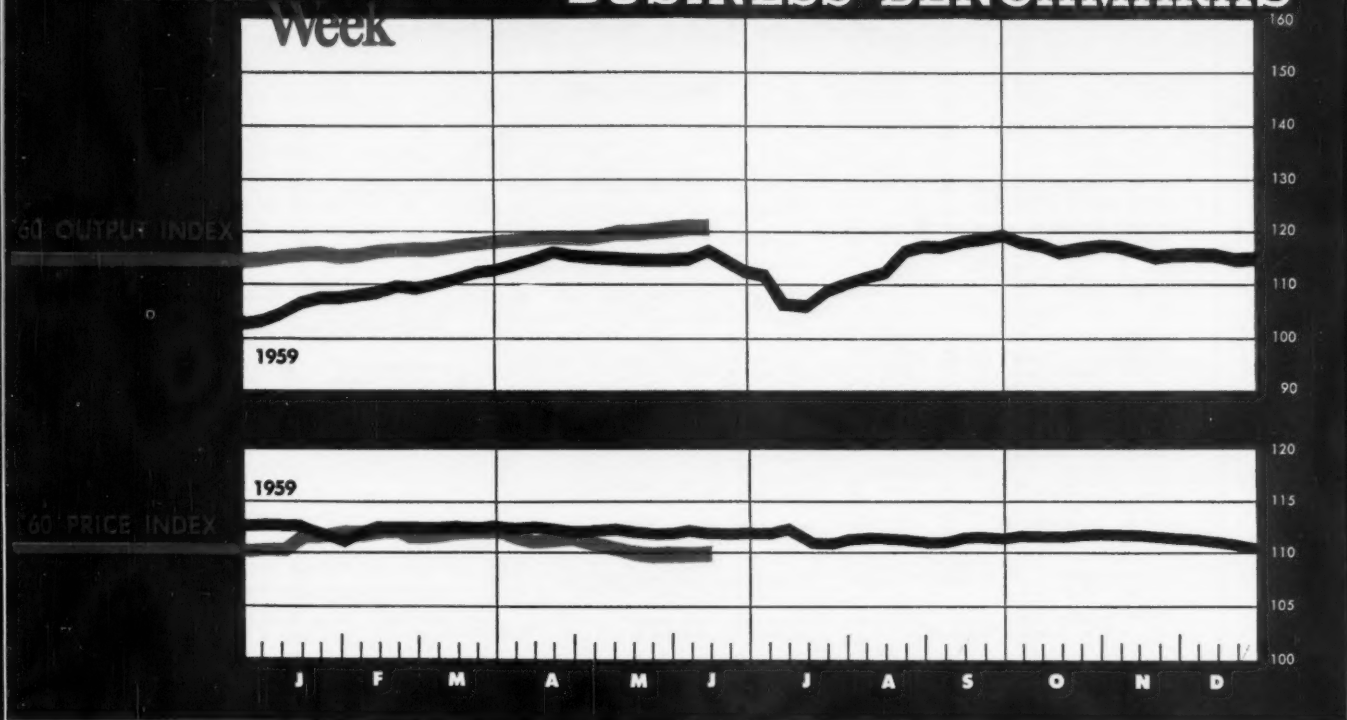
•

Aluminum Welding Wire: American Brazing Alloys Corp. (P. O. Box 11, Pelham, N. Y.) is offering a new aluminum welding wire as an all-purpose filler metal in gas- and electric-fusion welding. The wire, designated 4043, has a lower melting point than most aluminum alloys, fills solidification voids without setting up stresses in the parent metal. The wire's main alloy is 5% silicon.

•

Variable-Flow Pump: Blackmer Pump Co. (Grand Rapids, Mich.) is out with a new line of rotary pumps with a dial for instant change of flow rate. The pumps, called Vari-Flo, are offered in 2-, 3- and 4-in. sizes with capacities up to 450 gal./minute.

BUSINESS BENCHMARKS



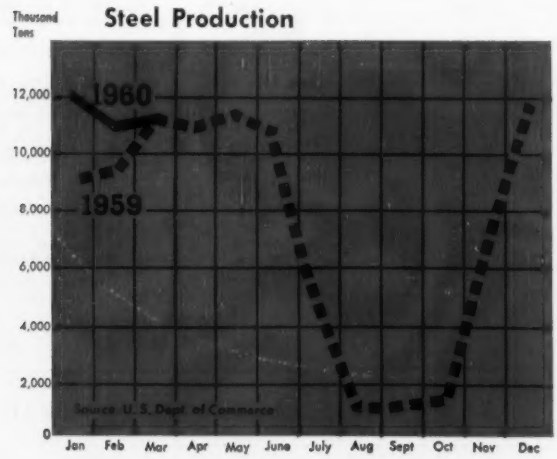
JUNE 11, 1960

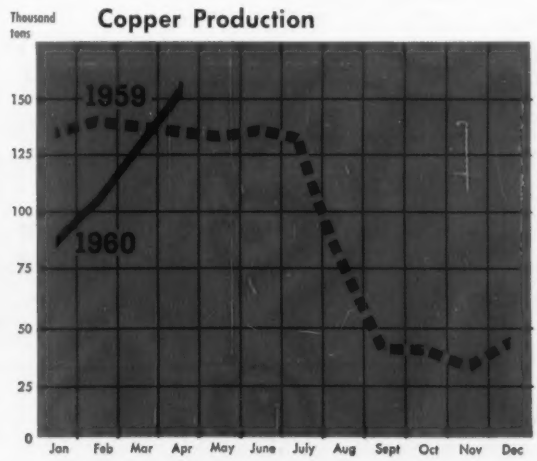
WEEKLY BUSINESS INDICATORS	*Latest Week*	*Preceding Week*	*Year Ago*
Chemical Week output index (1957=100)	121.6	121.6	115.4
Chemical Week wholesale price index (1947=100)	109.0	108.9	111.9
Stock price index (12 firms, Standard & Poor's)	50.96	51.32	58.46
Steel ingot output (thousand tons)	1,765	1,870	2,653
Electric power (million kilowatt-hours)	13,572	13,468	12,778
Crude oil and condensate (daily av., thousand bbls.)	6,815	6,864	7,203

FOREIGN TRADE INDICATORS
(million dollars)

	EXPORTS			IMPORTS		
	Latest Month	*Preceding Month*	*Year Ago*	*Latest Month*	*Preceding Month*	*Year Ago*
Chemicals, total	146.5	121.1	122.2	37.6	30.6	30.4
Coal-tar products	15.1	11.3	8.0	6.4	6.1	5.4
Industrial chemicals	27.4	24.1	19.6	12.0	9.5	8.8
Medicinals and pharmaceuticals	23.1	20.7	23.7	2.2	1.9	1.8
Fertilizers and materials	11.3	8.1	10.5	14.4	11.0	12.2
Vegetable oils and fat (inedible)	7.4	9.5	5.3	5.4	5.2	7.8

CHEMICAL CUSTOMERS CLOSE-UP





JUNE 11, 1960

tracers SECTION

(Classified Advertising)

F. J. Eberle, Business Mgr.

ADVERTISING STAFF

Atlanta 3 ..... Michael Miller, 1301 Rhodes-Haverty Bldg., JAckson 3-6951

Boston 16 Paul F. McPherson, 350 Park Square Building, HUbbard 2-7160

Chicago 11 ..... Alfred D. Becker, Jr., R. J. Claussen, 520 N. Michigan Ave., MOhawk 4-5800

Cleveland 13 .. H. J. Sweger, Duncan C. Stephens, 1164 Illuminating Bldg., 55 Public Square, SUperior 1-7000

Dallas 1 ..... Gordon Jones, John Grant, The Vaughan Bldg., 1712 Commerce St., Riverside 7-5117

Denver 2 J. Patten, 1740 Broadway, ALpine 5-2981

Detroit 26 H. J. Sweger, Jr., 856 Penobscot Bldg., WOodward 2-1793

Frankfurt/Main ..... Stanley Kimes, 85 Westendstrasse, Germany

Geneva ..... Michael R. Zeynel 2 Place du Port, Geneva, Switz.

Houston 25 ..... Gene Holland, W-724 Prudential Bldg., JAckson 6-1281

London E.C. 4 .. E. E. Schirmer, N. Murphy, McGraw-Hill House, 95 Farringdon St., England.

Los Angeles 17 ..... Robert Yocom, 1125 West Sixth St., HUntley 2-5450

New York 36 ..... Charles Haines, B. A. Johnson, P. E. McPherson, Charles F. Onasch, L. Charles Todaro, 500 5th Ave., OXford 5-5959

Philadelphia 3 William B. Hannum, Jr., 6 Penn Center Plaza, LOcust 8-4330

Pittsburgh 22 Duncan C. Stephens, 4 Gateway Center, EXpress 1-1314

San Francisco 4 William C. Woolston, 68 Post St., DOuglas 2-4600

St. Louis 8 R. J. Claussen, 3615 Olive St., Continental Bldg., JEfferson 5-4867

***For complete product data see catalog unit in the BUYERS' GUIDE ISSUE for 1959-60**

FYI: Chemical Week Reprints

Energy	$1	☐
Boron/Borax	$1	☐
Jet Fuels Heat is the barrier	$1	☐
Long-Range Planning How to fully realize growth potentials	$1	☐
Propylene	$1	☐
Butylenes	$1	☐
Acetylene	$1	☐
Ethylene Chemicals	$1.50	☐
Foreign Trade Challenge	$1	☐
Cellulose	$1	☐
Petrochemical Treasures	$1	☐
Rating Research	$1	☐
Cost Accounting	$1	☐
World Sulfur	$1	☐
Aromatics in Trouble	$1	☐
Vertical Integration	$1	☐
Steroids	$1	☐
Contract Research	$1	☐
Atomic Energy	$1	☐
Ideas from Outsiders	$1	☐
Pharmaceuticals	$1	☐
Market for Waxes	$1	☐
Cost Cutting	$1	☐
Man-Made Fibers	$1	☐
Motivation Research	$1	☐
Petrochemicals	$1	☐
Plastics Outlook	$1	☐

Chemical Week
Reprint Dept., Room 2400
330 W. 42nd Street
New York 36, N. Y.

Please send me the CW Reports checked above. Enclosed is $ .....
Send price of ..... copies

(Bulk prices on request)

Tracers

TO THE CHEMICAL PROCESS INDUSTRIES

Published: each Saturday—closes 11 days in advance.

Rate—$3.00 per line ($1.50 per line for position wanted ads), minimum 3 lines. Allow 5 average words as line; Count one half line for box number.

ADDRESS BOX NO. REPLIES TO: Box No. Classified Adv. Div. of this publication. Send to office nearest you.
NEW YORK 36: P. O. BOX 12
CHICAGO 11: 520 N. Michigan Ave.
SAN FRANCISCO 4: 68 Post St.

POSITIONS VACANT

Chemist experienced in the polymerization of elastomers. All applications will be treated in strict confidence. Plant located in New York Metropolitan area. P-4526, Chemical Week.

Aerosol Filler requires graduate pharmacist or M.S. in bacteriology with laboratory experience to work in research, development and control section. Reply stating experience and salary required. P-4583, Chemical Week.

Physical Chemist: A major producer of synthetic fibers has an attractive opening for Ph.D. in physical chemistry with 0-2 years experience to work in Polymer Research and Development Group studying and relating molecular structure of fibers to processing conditions, and in process development of new fibers. Pleasant working and living location near Asheville, N.C. Excellent benefits; five-day work week; moving expenses. Send complete resume including salary requirements to Employment Manager, Enka, N.C. American Enka Corporation, Manufacturers of Rayon and Nylon.

Chemical Sales. Leading industrial chemical manufacturer has excellent opportunities in organic chemical sales for both experienced sales representatives and sales trainees. Both positions require a college chemistry degree; the experienced salesman should also have 3 to 5 years experience in chemical sales. All positions may require relocation. Starting salaries commensurate with experience, incentive participation, travel expenses and company automobile and company-paid benefit plans. If you are interested in a responsible and challenging sales position, please send your confidential resume to: Personnel Department, Emery Industries, Inc., 4200 Carew Tower, Cincinnati 2, Ohio.

Chemical Engineer-build, then operate small phthalic anhydride plant New York area. P-4573, Chemical Week.

SELLING OPPORTUNITIES AVAILABLE

Specialty equipment company requires manu-facturers representative. Should be in the 35 to 45 age range and presently handling similar accounts. Several territories open. Submit resume to RW-4099, Chemical Week.

Experienced Salesman wanted—industrial chem-icals. Chemical background preferred. Worth Chemical Corporation, Greensboro, N.C.

POSITION WANTED

Mechanical and Civil Engineer—M.S. in C.E. Age 39. Desires responsible position in design engineering. 14 years experience, including 8 years with chemical processing industry. Present salary $10,8000.00. PW-4546, Chemical Week.

SPECIAL SERVICE

High Vacuum molecular distillation for large quantity runs on a toll basis. Molecular Distillations, Inc., 527 Madison Avenue, New York 22, Tele: Plaza 3-6527.

SELLING OPPORTUNITIES WANTED

Manufacturer Agent Available—Detroit Area Distributor offers experienced sales representation by technically qualified men. Warehousing, tank storage, tank-car and box-car unloading, drumming facilities available and delivery. Write Deutser & Willihnganz, 615 E. Greendale—Detroit 3, Mich.

Manufacturers' Agent—Starting West Coast (Los Angeles) representation. Recently sales manager industrial chemicals. 13 years executive selling experience in heavy chemicals and equipment. Excellent credential and education. RA-4567, Chemical Week.

Export/Foreign Operations. Well-established company with office and affiliates world-wide wishes to represent basic manufacturers. Finance and market research available. Balfour, Guthrie & Co., Limited, 72 Wall Street, New York 5, N.Y.

Largest South African Importers and Distributors of industrial chemicals wish to represent American manufacturers as agents and distributors. Write to—Joseph, Bond & Jeans Inc., 20 West 43rd Street, (Salmon Tower), New York 36, N. Y.

FOR SALE

Send for Revised Illustrated Circular on our $3,000,000 chemical plant liquidation at Orange, Texas. All T316 SS equipment including tanks, columns, heat exchangers, filters, centrifugals, pumps, valves, pipe, etc. Perry Equipment Corp., 1415 N. Sixth Street, Philadelphia 22, Pa.

Hexamethyleneadipamide (6-6 Nylon Salt), Hex-amethylene Diamine, Adipic Aid suitable as raw materials of high purity for Textile and Plastics production available for sale. Attractive prices and terms. Quotations and laboratory test samples airmailed on request—S.I.C.I. s.r.l.—Parabiago (Milan), Italy.

Plasticizer: Lowest Priced primary phthalate plasticizer; excellent solvation and efficiency, excellent compatibility with secondary plasticizers. Regularly available in transport trucks or drums. Mercury Chemical Corp., Edison, N.J., Liberty 8-1540.

Chemical tank trailers, stainless steel, rubber-lined, pressure, all types for sale or lease. Hackett Tank Company, Inc. 541 South 10th Street, Kansas City, Kansas, Phone: Mayfair 1-2363.

Two Recording Spectrophotometers, Perkin-Elmer, Model 13-U and 21. Contact Mr. Howard Scoop at Plax Corporation, P.O. Box 1019, Hartford, Conn.

Struthers-Wells 630 sq. ft. T316 SS single effect evaporator, 2" OD tubes, 30# WP. Perry Equipment Corp., 1415 N. 6th St., Phila. 22, Pa.

Baker Perkins #15-UUMM Dispersion Mixer, 100 gal., jacketed, cored dispersion blades, 100 HP XP drive compression cover. Perry Equipment Corp., 1415 N. 6th Street, Philadelphia 22, Pa.

Dark Dioctyl Sebacate Bulk, 32¢ lb. DBS Plast, Virgin Bulk 35¢ Isoprene-Enjay virgin 3 drums $15. Virgin Neopentyl Glycol-20-100# drums. Trimethylol Propane 20-100# drums. Barrett Pyridine 15A 3 orig. drums $.35/lb. DDA Plast., Virgin, 20 drs 37¢/lb. FS-4592, Chemical Week.

CHEMICALS WANTED

Surplus Wanted—Chemicals, Pharmaceuticals, Oils, Acids, Plasticizers, Resins, Dyes, Solvents, Pigments, Etc. Chemical Service Corporation, 96-02 Beaver Street, New York 5, N. Y. HAnover 2-6970.

WANTED

Wanted: Rotary Vacuum Dryer or Ribbon Blend-er—Horizontal 125# ASME, coded jacket, approximately 1,200 gallons or 160 cu. ft. capacity. Helical ribbon. Steel or stainless steel considered. Please send details and asking price to W-4574, Chemical Week.

If you are a manufacturer seeking new or added sales outlets—or if you are a manufacturer's agent or chemicals distributor with the capacity, time and energy to take on additional lines—make your interests known in this column of Chemical Week. The right agent or jobber teamed up with the saleswise manufacturer makes the right combinations for the hard selling days ahead. There's profit for both, which can be initiated through low-cost classified advertising. Write Employment Opportunities, Chemical Week. P.O. Box 12, New York 36, N.Y.

WHAT'S NEWS IN CHEMICALS

BUTADIENE • A high purity diolefin, it gives top quality to latex paints. It fulfills the most rigid requirements for purity and uniformity . . . helps water emulsion paints roll on smoothly, evenly, and easily.

DICYCLOPENTADIENE • As an extender for drying oils in varnish manufacture, it reduces the cost of the finished product. As a modifier for semi-drying oils, it upgrades them by approaching drying oils in reaction and drying time.

METHYL ETHYL KETONE is a solvent used in the manufacture of many lacquers and shellacs. It assures durable surface coatings for fine furniture. Of high purity and low acidity, it provides maximum solvent power at minimum cost.

TECHNICAL ASSISTANCE • At the Enjay Buton testing laboratory the most modern equipment and methods are always at work to help customers in the solution of technical problems and new product applications.

ANOTHER FIRST FROM ENJAY FOR BETTER

ENJAY
PETROCHEMICALS

A new line of thermosetting polymers for better container coatings and countless other products now joins the family of chemical raw materials that Enjay offers the surface coatings industry. These new polymers – Buton Resins – were formerly called C-Oil and Butoxy Resins. They offer tough, high-quality coatings comparable to those obtained from higher-priced materials. Buton Resins may be cured by air dry – force dry cycles, low-temperature bakes, high-temperature bakes, or a new technique called flame curing. Flame curing produces the tough, chemically resistant finish 20 to 50 times faster than conventional bake cycles.

Buton Resins offer multiple advantages. They can be blended with ureas, melamines, short and medium oil alkyds, vinyls, phenolics and nitrocellulose to obtain specific properties. They provide adhesion on various substrata,

SURFACE COATINGS... BUTON* RESINS

high gloss, good pigment wetting and good corrosion and chemical resistance. Buton Resins can be used in primer formulations for appliances, automobiles, and all types of metals. They can also be formulated for use in container linings, finishes for furniture, wire coatings, etc. For technical assistance or to order any Enjay chemical, write or phone.

HOME OFFICE: 15 West 51st Street, New York 19, N. Y. OTHER OFFICES: Akron • Boston • Charlotte • Chicago • Detroit • Houston • Los Angeles • New Orleans • Tulsa.

*Trademark

EXCITING NEW PRODUCTS THROUGH PETRO-CHEMISTRY

ENJAY CHEMICAL COMPANY

A DIVISION OF HUMBLE OIL & REFINING COMPANY

ENJAY

PETROCHEMICALS

SCIENTIFIC DESIGN

is the recognized leader in

LIQUID PHASE OXIDATION

plant design

Maruzen starts up SD-designed terephthalic acid plant in Japan

Mitsui continues to operate its plant at more than double initial installation and is largest producer in Asia

Maruzen Oil Company, Ltd. has placed onstream an SD-designed terephthalic acid plant near Maruzen's refinery at Matsuyama City on Shikoku Island. In 1957, Maruzen became the first Japanese company to place a petrochemical plant onstream.

Mitsui Petrochemical Industries, Ltd. has been operating its SD-designed terephthalic acid plant for over one and a half years, the first to produce terephthalic acid commercially from petroleum based feedstocks utilizing the liquid-phase air oxidation process. Mitsui is producing at a rate in excess of 30,000,000 pounds per year.

Imperial Chemical Industries Ltd., England, is nearing completion of their SD-designed terephthalic acid plant. The 30,000,000 pound per year plant is located at ICI's giant Wilton Works.

The SD-designed terephthalic acid plants employ the liquid-phase oxidation of aromatics process licensed by Mid-Century Corporation, a wholly owned subsidiary of Standard Oil Company (Indiana). Amoco Chemicals Corporation has an SD-built plant at Joliet, Illinois, for the production of phthalic, isophthalic, and terephthalic acids.

SCIENTIFIC DESIGN COMPANY, INC.

Leader in Design, Development, Construction of Chemical Plants

EXECUTIVE OFFICES: TWO PARK AVENUE, NEW YORK 16, NEW YORK

THE SD GROUP:

SD Plants Inc., New York • SD Plants Canada Ltd., Toronto

SD Plants Ltd., London, England • Catalyst Development Corporation, New Jersey

Société Française des Services Techniques S.a.r.l., Paris, France

SD 158